SOWERBY'S ENGLISH BOTANY.

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ENGLISH BOTANY.

LONDON: PRINTED BY
SPOTTISWOODE AND CO., NEW-STREET SQUARE
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ENGLISH BOTANY;

B. L.

OR,

COLOURED FIGURES

OF

BRITISH PLANTS.

581

EDITED BY JOHN T. BOSWELL SYME, F.L.S. Etc.

THE POPULAR PORTION BY MRS. LANKESTER,
AUTHOR OF "WILD FLOWERS WORTH NOTICE," "THE BRITISH FERNS," ETC.

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Third Edition,
ENLARGED, RE-ARRANGED ACCORDING TO THE NATURAL ORDERS,
AND ENTIRELY REVISED.
WITH DESCRIPTIONS OF ALL THE SPECIES BY THE EDITOR.

VOLUME XI.

GRAMINA.

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S C I W

ENGLISH BOTANY.

ORDER LXXXVIII.—**GRAMINA.**

Annual or perennial herbs, rarely shrubs or trees, with tufted or creeping soboliferous rhizomes. Stem cylindrical or 2-edged, commonly hollow except at the nodes, simple or branched. Leaves alternate, distichous, sheathing, with the sheath almost always split to the base, or rarely only at the apex, generally with a small prominent scale (*ligule*) at the apex of the sheath, between the stem and the lamina; lamina usually linear, rarely lanceolate, with parallel venation. Flowers perfect or unisexual, and in that case monœcious, very rarely diœcious or polygamous, in spikelets arranged in panicles, spikes, or compound spikes; the part of the stem passing through the inflorescence is termed the *rachis.* Glumes 2 at the base of the spikelet, rarely solitary or absent. Florets in the spikelets, when more than 1, arranged on an *axis*, bifarious, each enclosed between 2 glumelles (*pales*) or scarious bracts, generally resembling the glumes, but the inner one usually smaller and sometimes absent; glumes and pales frequently with the midrib excurrent, forming an awn. Perianth none, or represented by 2 minute hypogynous scales (*lodicules*). Stamens 3, rarely 1, 2, or 6; filaments filiform; anthers affixed by the back, versatile. Ovary solitary, free from the perianth, 1-celled, 1-ovuled. Styles 2, rarely united to the base, very rarely 1, each style or branch terminating in a stigma, which is often plumose. Fruit a grain (*cariops*), free or adhering to the pales, in the former case, however, usually enveloped in them, oblong-cylindrical or oblong-ovoid, or subglobose, more or less compressed. Pericarp chartaceous, rarely crustaceous. Seed with the testa adhering to the pericarp; albumen copious, farinaceous; embryo minute, at the base of the albumen on the upper side.

TRIBE I.—ORYZEÆ.

Spikelets closed during flowering, arranged in a lax open panicle, laterally compressed, each containing a single perfect or unisexual floret (in the latter case monœcious or monœciously-polygamous), sometimes accompanied by the rudiments of 1 or 2 other florets. Glumes both absent or rudimentary. Pales glumelike, equal or nearly so, the lower one keeled, 5- to 7-ribbed, the upper one 3- or rarely 5-ribbed. Stamens 6, 3, 2, or 1. Styles short; stigmas 2, protruded at the base of the floret, between the margins of the pales. Caryops free, laterally compressed, not furrowed.

GENUS I.—**LEERSIA.** *Soland.*

Spikelets shortly stalked, arranged in a lax open panicle, sometimes enclosed in the uppermost leaf-sheath, laterally compressed, closed during flowering, each containing a single perfect flower, or in some of the spikelets a single male flower without the rudiment of another. Glumes absent. Pales 2, equal, boatshaped-compressed and keeled, not awned, parchmentlike. Lodicules 2, membranous. Stamens 6, 3, 2, or 1. Styles 2, short, terminal; stigma feathery, protruded at the sides of the flower. Caryops glabrous, free from but closely enveloped by the pales, strongly laterally compressed, not furrowed.

A genus of grasses named after a botanist, Mr. J. D. Leers. There is but one British species.

SPECIES I.—**LEERSIA ORYZOIDES.** *Soland.*

PLATE MDCLXXXVI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXXI. Fig. 494.
Billot, Fl. Gall. et Germ. Exsicc. No. 1582.
Phalaris oryzoides, *Linn.* Spec. Pl. p. 81.
Asprella oryzoides, *Lam.* *Dumort.* Agrost. Belg. p. 133.

Panicle compound, subpolygamous, its primary branches bare of spikelets at the base, spreading (when the panicle is exserted). Spikelets shortly stalked, loosely imbricated, half-oval-oblong, flat. Lower pale strongly bristly-ciliate. Stamens 3 in the perfect florets.

In wet places, by the sides of streams, ditches, and ponds, and in the shallow water at their edges. Very local along the edges of marsh ditches in Henfield Level, Sussex. Abundant in the Boldre River, Hants, for nearly three miles along the stream above and below

Brockenhurst Bridge. In several places by the side of the Mole, Surrey, from East Moulsey to Brockham Bridge, and by the canal near Woking Station, Surrey.

England. Perennial. Late Autumn.

Rootstock extensively creeping, producing small tufts of stems and long white scaly stolons. Stems erect or somewhat decumbent and subgeniculate at the base, cylindrical, smooth with downy nodes, simple or sparingly branched near the base, 9 inches to 4 feet high. Leaves numerous, flat, 3 inches to 1 foot long by $\frac{1}{4}$ to $\frac{1}{2}$ inch broad, gradually acuminated, pale green, thin, rough, with bristles on the margins, and on the midrib beneath, especially towards the base. Sheaths covering the internodes and frequently even the nodes, rough. Ligule short, about half as long as broad, blunt, erose-denticulate. Panicle 2 to 9 inches long, frequently remaining permanently included in the slightly swollen sheath of the uppermost leaf, but sometimes wholly exserted: in the former case, the spikelets are nearly all perfect; in the latter, some or even all of them have occasionally the ovary abortive. Rachis striated, rough; panicle branches, especially the ultimate ones, capillary, flexuous, rough. Spikelets very shortly stalked, articulated to the pedicels, $\frac{1}{5}$ to $\frac{1}{4}$ inch long. Glumes absent. Lower pale much more curved than the upper, and abruptly acuminated into a short blunt point, nearly white and transparent with a green stripe along the lateral rib, which is nearer to the margin than to the keel, minutely pubescent, with longer hairs along the margins, lateral ribs, and keel, especially on the latter; upper pale linear, a little longer than the lower, strongly ciliated on the keel, especially towards the apex. Stamens sometimes only 2 in the submale florets.

I have never seen this plant growing wild except by the banks of the Mole. There the panicle is generally included, but in some seasons it is fully exserted. In cultivation in a tank in the greenhouse at Balmuto the panicle has never been exserted.

As it has been frequently remarked, Leersia oryzoides bears a striking resemblance to small specimens of Digraphis arundinacea. It is, however, of a yellower green and much rougher in its foliage, and by this may be readily known when not in flower, or when the spikelets are enclosed in the uppermost leaf-sheath.

European Cut-Grass.

French, *Léersie à fleurs de riz.* German, *Wilder Reis.*

TRIBE II.—SPARTINEÆ.

Spikelets closed during flowering, arranged in 1 or 2 more or less unilateral rows on the branches of a digitately or racemosely compound spike, or rarely in 2 rows in a unilateral simple spike or spike-like raceme, laterally compressed, each containing a single perfect floret, sometimes with a rudimentary one above it. Glumes conspicuous. Pales large, nearly equal, the lower one usually keeled, the upper one 2-ribbed. Stamens 3, rarely 2. Styles long or rather short; stigmas 2, protruded at the apex of the floret or about its middle, between the tips or edges of the pales. Caryops free, laterally compressed, not furrowed.

GENUS II.—**SPARTINA.** *Schreb.*

Spikelets sessile, arranged unilaterally in 2 rows on the racemosely disposed branches of a compound spike, laterally compressed, closed during flowering, each containing a single perfect floret without the rudiment of another. Glumes 2, unequal, the upper one much the larger and equalling or exceeding the pales, greatly laterally compressed, keeled, pointed or very shortly awned, sub-coriaceous. Pales 2, unequal, the upper one much the longer, the lower one lanceolate, compressed and keeled, entire or notched at the apex, not awned, upper pale folded in two with 2 approximate dorsal ribs not raised into keels. Lodicules very short. Stamens 3. Styles 2, elongated, more or less coherent; stigmas long, rather thick, shortly hairy, protruded at the apex of the floret. Caryops glabrous, free, strongly laterally compressed, not furrowed.

The name of this genus is derived from the Greek, *σπάρτον*. Brooms made of the Lygeum Spartum and like material are still called *spartes* by the French, and the Spaniards call the Stipa tenacissima *Esparto*.

SPECIES I.—**SPARTINA STRICTA.** *Roth.*

PLATE MDCLXXXVII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXI. Fig. 451.
Billot, Fl. Gall. et Germ. Exsicc. No. 1089.
Dactylis stricta, *Soland.* *Sm.* Engl. Bot. ed. i. No. 380.
D. cynosuroides. *Linn.* Spec. Plant. p. 104, ex part.
Trachynotia stricta. *D.C.* Fl. Fr. Vol. III. p. 74.
Limnetis pungens. *Pers.* Syn. Plant. Vol. I. p. 72.

Rootstock rather slender, extensively creeping. Stem erect from a curved base, leafy to the top, rather stout, soft, smooth. Sheaths articulated to the leaves, which readily separate from them; ligule* very short, fimbriate. Leaves with their apices rarely extending to the top of the second sheath above them, shorter than the spikes, broadly linear, flat, smooth, with closely-placed thick glaucous cartilaginous ribs on the face, dark green and shining on the back. Spikes 2, rarely 3 or 4, terminal, approximate sessile, or the upper ones shortly stalked, erect, closely applied to each other by their backs, unilateral; rachis flexuous, flattened on the back, smooth, extending beyond the base of the uppermost spikelet, but not conspicuously exceeding and often falling short of its glumes. Spikelets 6 to 10 in each spike, erect, alternate, about half their own length apart, sessile, linear-lanceolate. Glumes unequal, pubescent, the lower one about two-thirds the length of the upper, acuminate; the upper one bidentate, with a very short terminal awn, 1-ribbed, coarsely and shortly ciliated on the keel.

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* In this work it is the ligule of the uppermost leaf which is described, unless the other leaves are specially mentioned.

In muddy salt marshes covered at high water, especially near the mouths of tidal rivers. Rather local, but abundant in many places on the south and east coast from Devon to Lincoln.

England. Perennial. Late Summer, Autumn.

Root extensively creeping, producing the stems in small tufts. Flowering stems 6 inches to 1 foot high, rarely more, though I have seen specimens 2 feet high. Stem rather succulent, easily broken, its knots covered by the leaf-sheaths. Leaves 2 to 6 inches long by $\frac{1}{6}$ to $\frac{1}{4}$ inch broad, erect, stiff but not tough. Spikes 2 to $3\frac{1}{2}$ inches long, all so closely applied that they give the inflorescence the appearance of a single spike; this is particularly the case when there are only 2 spikes. Spikelets $\frac{1}{2}$ to $\frac{3}{5}$ inch long, pale yellowish-olive. Anthers yellowish-white. Stigmas very conspicuous when protruded, nearly white. Plant with a strong odour resembling that of the brackish water Algæ.

The leaves are quite flat when the plant is growing, but become involute as they dry, and at length are pungent at the apices. They are so readily detached from the sheaths, that by the time the plant is in flower most of the lower sheaths have lost their laminæ.

Twin-spiked Cord-Grass.

French, *Spartine roide.*

SPECIES II.—SPARTINA ALTERNIFLORA. *Loisel.*

PLATE MDCLXXXVIII.

S. stricta, var. alterniflora. *Gray,* Man. Bot. N.U.S. ed. v. p. 620.
Trachynotia alterniflora. *D.C.* Fl. Fr. Vol. V. p. 279.

Rootstock rather stout, extensively creeping. Stem erect from the base, leafy to the top, stout, soft, smooth. Sheaths smooth, not articulated with the leaves; ligule very short, composed of short hairs.

Leaves with their apices extending beyond the top of the second sheath above them, as long as or longer than the spikes, broadly-linear, flat, smooth, with closely-placed thick glaucous cartilaginous ribs on the face, dark green and shining on the back. Spikes 5 to 8 (rarely 3 or 4 or more than 8), terminal, sub-approximate, sessile, erect, the uppermost one stalked, loosely applied to each other, distichous, slightly unilateral; rachis slightly flexuous, triquetro-trigonous, smooth, extending beyond the glumes of the uppermost spikelet for a distance about equal to these glumes. Spikelets 8 to 20 in each spike, erect, alternate, more than half their own length apart, sessile, linear-lanceolate. Glumes unequal, glabrous or sub-glabrous, the lower one about half the length of the upper, acuminate, the upper one entire, gradually accuminated or obliquely truncate at the apex, which has no distinct awn, 3-ribbed, rough on the keel.

On mud in tidal rivers, submerged at low water. Rare; abundant on the mud-flats of the river Itchen, probably introduced from America.

England. Perennial. Late Summer, Autumn.

Very near S. stricta, of which Dr. J. Hooker, in his admirable "Student's Flora," regards it as a sub-species, while Dr. Asa Gray considers it as but a variety of S. stricta. S. alterniflora is a much larger and stouter plant, 18 inches to 4 feet high, with leaves 6 to 18 inches long by $\frac{1}{4}$ to $\frac{1}{2}$ inch broad, not contracted and articulated at the base as in S. stricta; the spikes, besides being more numerous, are more slender, more distant, more loosely applied, and from 3 to 6 inches long or more. The point of the rachis is prolonged much further beyond the uppermost spikelet, and has the spikelets more distychous and placed further apart than in S. stricta; the spikelets are rather smaller, scarcely $\frac{1}{2}$ inch long, and glabrous; the outer glume is shorter, the inner one not conspicuously notched, and without an evident awn or mucro, and the sides have each a conspicuous lateral rib.

Many-spiked Cord Grass.

Dr. Bromfield states that at Southampton this grass is "regularly cut down by the poorer classes and employed by them in lieu of straw or reeds for thatching outhouses, cowsheds, &c.; and more extensively for litter, and subsequently as manure. Horses and pigs, I am told, eat it greedily."—*Phyt.* 1850, p. 1096.

GENUS III.—CHAMAGROSTIS. *Borkh.*

Spikelets subsessile, arranged unilaterally in 2 rows in a spike-like raceme, scarcely compressed, closed during flowering, each containing a single perfect floret without the rudiment of another. Glumes 2, nearly equal, rounded on the back, obtuse and not awned, subscarious, longer than the pales. Pales 2, unequal, scarious, truncate, not awned, the lower one the larger, rounded on the back, inclosing the upper one, upper one with 2 ribs. Lodicules 2, very minute. Stamens 3. Styles 2, free; stigmas very long, slender, hairy, protruded at the apex of the flower. Caryops glabrous, free, laterally compressed, not furrowed.

Name from χαμαί, on the ground, and ἄγρωστις, grass.

SPECIES I.—CHAMAGROSTIS MINIMA. *Borkh.*

PLATE MDCLXXXIX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXII. Fig. 453.
Billot, Fl. Gall. et Germ. Exsicc. No. 1089.
Mibora verna, *Pal. de Beauv.* *Gren. & Godr.* Fl. de Fr. Vol. III. p. 444. *Parl.* Fl. Ital. Vol. I. p. 103. *Reichel*, c. p. 57.
M. minima, *Desv.* *Bab.* Man. Brit. Bot. ed. vi. p. 401. *Dumort.* Agrost. Belg. p. 137.
Knappia agrostidea. *Sm.* Eng. Bot. ed. i. No. 1127.
Sturmia verna, *Pers.* *Syn.* Vol. I. p. 76.
S. minima, *Hoppe.* *Gaud.* Fl. Helv. Vol. I. p. 148.
Agrostis minima. *Linn.* Sp. Plant. p. 93.

The only known species.

In sandy pastures by the sea. Very local. Anglesea. Not uncommon in Jersey. It is said to have occurred near Leigh, Essex; but there are no specimens in existence to confirm this unlikely locality. About twenty years ago it was abundant on Gosford Links, Haddington, where I believe it was sown by the late Dr. Knapp of Edinburgh; but in 1868 it was not to be found there.

England. Annual. Spring.

Plant growing in small tufts, producing numerous flowering stems, $\frac{1}{2}$ to 3 inches high; these stems are setaceous, ascending, smooth, tinged with purple, leafy only at the base. Leaves $\frac{1}{8}$ to $\frac{1}{2}$ inch long, very narrowly linear, channelled, obtuse, glabrous, clothed with minute raised points, the lower ones with dilated white membranous sheaths, the upper with narrower and longer sheaths produced at the top into white hyaline auricles, which are continued into the prominent ligule. Spike $\frac{1}{4}$ to $\frac{1}{2}$ inch long of 4 to 12 subsessile unilateral and distichous florets, scarcely $\frac{1}{10}$ inch long. Glumes lead-colour tinged with purple, with a green keel, the outer one subsaccate at the base, both of them truncate erose and hyaline at the apex. Pales downy with white hairs.

This little grass has enjoyed a multitude of names, and among these it is difficult to decide which ought to be adopted. I have followed Kunth, Koch, Mr. Bentham, and Dr. Hooker in calling it Chamagrostis minima, though Adanson's generic name—Mibora is older, and on this account has been adopted by Professor Babington. But British authors have not adopted the oldest generic name in similar cases; as, for example, Arctium is universally employed by them instead of Lappa. French authors of course may be put out of the question, as they invariably give the preference to a name bestowed on a plant by a Frenchman whenever there is a shadow of an excuse for doing so.

Early Sand-Grass.

GENUS IV.—**CYNODON.** *Rich.*

Spikelets sessile, arranged unilaterally in 2 rows on the digitately disposed branches of a compound spike, laterally compressed, closed during flowering, each containing a single perfect floret with the rudiment of a second one above it. Glumes 2, nearly equal, keeled, pointed but not awned, subscarious, rather shorter than the pales. Pales 2, equal, parchment-like, pointed but not awned, the lower one boat-shaped, bluntly keeled and inclosing the upper one, the upper one with 2 small approximate keels on the back separated by a furrow. Lodicules 2, fleshy. Stamens 3. Styles 2, short, separate; stigmas long, rather thick, densely hairy, protruded below the apex of the flower. Caryops glabrous, free, laterally compressed, not furrowed.

The derivation of the name of this genus is from *κύων*, a dog, and *ὀδούς*, a tooth, as the common name of the species indicates.

SPECIES I.—**CYNODON DACTYLON.** *Pers.*

PLATE MDCXC.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXII. Fig. 454.
Billot, Fl. Gall. et Germ. Exsicc. No. 1581.
Panicum Dactylon, *Linn.* *Sm.* Engl. Bot. ed. i. p. 850.
Paspalum Dactylon. *D. C.* Fl. Fr. Vol. III. p. 16.

Stems prostrate and extensively creeping, producing short barren and flowering branches, the latter geniculate and erect or ascending, with the upper node much longer than the others. Leaves short, flat, involute and obtuse at the apex. Spikes 2 to 7, slender, unilaterally distichous, diverging.

In sandy pastures by the sea. Very rare; confined to the western portion of the south coast of England, from Cornwall to Dorset, chiefly in the neighbourhood of Penzance and Poole. Vazon Bay, Guernsey. It used to be naturalised on Kew Green, near the church, where I gathered it in 1852; but I am not aware if it still maintains its station there.

England. Perennial. Summer, Autumn.

Stems prostrate, 3 inches to 3 feet long, rooting at intervals, and sending up barren and flowering shoots 2 inches to 1 foot high. Barren shoots often prostrate, densely clothed with distichous rigid glaucous leaves 1 to 3 inches long. These leaves are glaucous, narrowed towards the apex, glabrous or slightly hairy beneath. with numerous close cartilaginous ribs, and with a few long ciliæ at the top of the sheaths on each side of the obscurely marked ligule. Spikes $\frac{1}{2}$ to 2 inches long. Glumes more or less tinged with purple. Spikelets $\frac{1}{12}$ inch long. Lower pale ciliated. Stigmas protruded about the middle of the pales, not between their tips as in the other Spartineæ.

Creeping Dog's-tooth-Grass.

French, *Chiendent dactyle.* German, *Gefingerter Hundszahn.*

This curious little grass is very local, and confined almost entirely to the south coast. For a long time it was supposed to be peculiar to Penzance, but now both the Devon and Dorset coasts claim it as a rare native. It is, however, highly probable that minute search would at least tend to increase its stations, as few even amongst working Botanists are sufficiently critical in grasses to assure us that all its stations are ascertained. It throws out long, very tough runners, which creep for many yards through and over the loose soil, rooting at every joint, and furnished with flat, rather short, leaves, of a slightly glaucous hue. When in bloom the grass has a very peculiar aspect, differing from that of any other native species. Its long runners or rhizomes and its rapid growth render it an excellent sand-binder, for it soon forms a complete mesh-work of creeping shoots which shelter the sand from the action of the wind, and cover it with a thick carpet of foliage. It is on this account worthy of introduction on all sandy shores, and the more so as it yields a tolerable fodder for cattle and sheep. In India, where it abounds, it is considered the best pasture grass, and is known as Doorba or Duroa. Its only drawback is its liability to be destroyed by severe frost and its leaves dying off in the winter; near the coast, however, it is less liable to these accidents than when grown inland.

TRIBE III.—PANICEÆ.

Spikelets closed during flowering, arranged in a lax open panicle or placed in 2 unilateral rows on the branches of a digitately or racemosely compound spike, or in fascicles arranged in a cylindrical often dense compound spikelike panicle, dorsally compressed, each containing a single perfect floret accompanied by an inferior rudimentary one. Upper glume large, the lower one small or rudimentary. Pales unequal, the lower one not keeled, the upper one of the rudimentary floret sometimes absent. Stamens 3 or 2. Styles long; stigmas 2, protruded at the apex of the floret between the tips of the pales. Caryops dorsally compressed, not furrowed, or furrowed on the face furthest from the rachis.

GENUS V.—**DIGITARIA.** *Scop.*

Spikelets in pairs, one of which is sessile, the other shortly stalked, arranged unilaterally in 2 rows on the digitately or racemose-digitately disposed branches of a compound spike, dorsally plano-convex, closed during flowering, each containing a single perfect floret with the rudiment of a second neuter one beneath it. Glumes 2, very unequal, the lower one minute or obsolete, the upper one shorter than the pales, 5 to 7 ribbed on the back, acute but not awned, subscarious. Pales 2, equal, parchment-like, not ribbed, smooth, acute but not awned, concave, not keeled on the back, the neuter floret with but 1 pale, which is ribbed and resembles the upper glume. Lodicules 2, fleshy. Stamens, 3. Styles 2, terminal, elongate; stigmas short, rather thick, plumose, protruded at the apex of the flower. Caryops glabrous, free, bi-convex, not furrowed.

This genus is named in allusion to the disposition of the spikes, which are apart like fingers.

SPECIES I.—**DIGITARIA HUMIFUSA.** *Pers.*

PLATE MDCXCI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXXVIII. Fig. 506.
Billot, Fl. Gall. et Germ. Exsicc. No. 878.
D. filiformis, *Röl.* *Reich.* Ic. l.c. p. 68.
D. glabra, *Röm. & Schultes.* *Parl.* Fl. Ital. Vol. I. p. 127.
Paspalum ambiguum. *D. C.* Fl. Fr. Vol. I. p. 127.
Panicum glabrum, *Gaud.* *Hook. fil.* Stud. Fl. p. 425. *Koch, Syn.* Fl. Germ. et Helv. ed. ii. p. 892. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 462. *Kunth*, Enum. Plant. Vol. I. p. 83.
P. humifusum. *Kunth*, Gram. Vol. I. p. 33.

Stems prostrate. Leaves and sheaths glabrous. Spikes 2 to 8, digitato-racemose. Spikelets oval-elliptical. Lower glume rudimentary, upper one as long as the pales. Pale of the neuter floret pubescent, with the nerves glabrous, similar to the upper glume.

In sandy places, and a weed in garden ground. Rare. Near Christchurch, on the Wimborne Road, Hants; on Weybridge Common and adjacent Gardens, Surrey; about Ipswich and Bungay, Suffolk.

"Norfolk" (Hooker and Arnott's "British Flora"); but the station, if it exist, appears to be unknown to the Rev. Kirby Trimmer.

England. Annual. Summer, Autumn.

Stems numerous, spreading in a circle, generally simple, but branched in luxuriant examples, 2 inches to 1 foot long, slender, leafy throughout. Leaves $\frac{1}{2}$ inch to 3 inches long by $\frac{1}{8}$ to $\frac{1}{2}$ inch broad, gradually tapering towards the apex, dark dull green often tinged with purplish, with numerous, not contiguous, ribs, and 5 to 7 stronger ribs. Spikes $\frac{1}{2}$ to 3 inches long, slender, approximate, ultimately divaricate. Spikelets about $\frac{1}{10}$ inch long, at first green, ultimately more or less tinged with dark purple, the lower one nearly sessile, the upper one of each pair with a stalk of about its own length. Lower glume absent or very small.

Glabrous Finger-Grass.

German, *Blut-Hirse.*

Its spreading claw-like habit has obtained for it the name of crab-grass as well as finger-grass in the United States. In New York we saw it about houses growing much in the same manner as Poa annua with us, and we were inclined to look upon it in this position to be as with us an introduced agrarian. We say this on the assumption that D. sanguinale is scarcely separable from the D. humifusa. In Germany the allied species yields a small grain, much in demand as a substitute for sago and arrowroot.

GENUS VI.—ECHINOCHLOA. *Pal. de Beauv.*

Spikelets subsessile, in shortly stalked pairs and fascicles, unilaterally arranged in 2 rows on the racemosely disposed branches of a panicle resembling a compound spike, dorsally plano-convex, closed during flowering, each containing a single perfect floret with the rudiment of a second neuter one beneath it. Glumes 2, very unequal, the lower one much smaller than the upper, the upper one as long as the pales, rounded on the back, 5-ribbed, mucronate or awned, subscarious. Pales 2, equal, parchmentlike, not ribbed, smooth, acute, but not awned, concave, not keeled on the back, the lower floret with 2 pales, the lower one of which is ribbed, often awned, and resembles the upper glume. Lodicules 2, fleshy. Stamens 3. Styles 2, terminal, elongate; stigmas rather long, thick, plumose, protruded at the apex of the flower. Caryops free, biconvex, not furrowed.

This genus was probably named from some fancied resemblance to a hedgehog, ἐχῖνος, in its bristles or spikes, and χλόη, grass.

SPECIES I.—**ECHINOCHLOA CRUS-GALLI.** *Pal. de Beauv.*

PLATE MDCXCII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXCI. Figs. 515 and 516.

Billot, Fl. Gall. et Germ. Exsicc. No. 2167.

Oplismenus Crus-galli, *Kunth*, Enum. Plant. Vol. I. p. 143. *Dumort.* Agrost. Belg. p. 138.

Panicum Crus-galli, *Linn.* *Sm.* Engl. Bot. ed. i. No. 876. *Hook. fil.* Stud. Fl. p. 425. *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 892. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 460. *Parl.* Fl. Ital. Vol. I. p. 115.

Leaves glabrous, without any ligule. Branches of the spikes alternate, compound; rachis angular, hispid on the angles. Spikelets pubescent. Pale of the neuter floret mucronate or more or less longly awned.

In cultivated ground and waste places. Imperfectly naturalised. It used to occur year after year in Battersea Fields. In 1852 and 1853 it came up abundantly on the mud from the Thames laid down on what is now Battersea Park. It has also been reported from near Guildford and Godalming, Surrey. In the "British Flora" it is stated to have occurred near Thetford, Norfolk, and several localities are given for it in Middlesex in Trimen and Dyer's "Flora" of that county, viz., near Hampton Court, Appleton, and Barnet, &c., but it would perhaps be better to expunge it from the British lists even as a naturalised plant.

[England.] Annual. Autumn.

Stems numerous, often rooting at the base, geniculate below, stout, 1 to 3 feet high, generally branched. Leaves 3 inches to 1 foot long, deep dull green, with rather distant ribs and 9 to 11 stronger ones $\frac{1}{2}$ to 1 inch broad, with compressed sheaths. Panicle 3 to 7 inches long. Spikelets $\frac{1}{6}$ inch long (exclusive of the awn, which is very variable in length even in the same spike), oval-ovate, compressed, green, usually tinged with pale dull purple on the outer side.

Loose Panic-Grass.

French, *Panic pied de coq.* German, *Hühner-Hirse.*

This belongs to a large and widely-spread family of grasses, which, from their tendency to track cultivation, have, like cultivated or cereal grasses, become most difficult specifically to determine.

It has been found in waste places in various parts of England, as also as an occasional *visitant* in shifting crops. Just so does it track cultivation from New York to Carolina; but it is no more a native in America than it is at home.

GENUS VII.—**SETARIA.** *Pal. de Beauv.*

Spikelets subsessile, in small fascicles arranged on every side of the rachis of a dense cylindrical or slightly lobed spikelike panicle, dorsally plano-convex, closed during flowering, each surrounded at the base by an involucre of stiff bristles, and containing a single perfect floret with an imperfect male one beneath it. Glumes 2, very unequal, the lower one much smaller than the upper, the upper rather shorter than the pales, indistinctly ribbed, pointed but not awned, scarious. Pales 2, equal, parchmentlike, indistinctly ribbed or transversely rugose, acute, but not awned, concave, but not keeled on the back, the lower floret with 1 or 2 pales, the lower of which or the only one is indistinctly ribbed and resembles the upper glume. Lodicules 2, fleshy. Stamens 3 in the perfect flower, but usually only 1 or 2 in the male flower. Styles 2, terminal, elongate; stigmas short, thick, hairy, protruded at the apex of the flower. Caryops glabrous, free, plano-convex, not furrowed.

This genus of Grasses is so called from *seta*, a bristle or hair.

SPECIES I.—**SETARIA VIRIDIS.** *Pal. de Beauv.*

PLATE MDCXCIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXXVIII. Fig. 510.
Billot, Fl. Gall. et Germ. Exsicc. No. 475.
Panicum viride, *Linn.* *Sm.* Engl. Bot. ed. i. No. 875.

Panicle spikelike, oblong-cylindrical or fusiform-cylindrical, very dense, continuous, not lobed. Bristles of each spikelet 3 to 6, more than twice as long as the spikelet, rough with prickles pointing upwards, green, often tinged with purple. Upper glume as long as the fertile floret. Upper pale of the male floret half the length of the lower, which about equals the fertile floret. Pales of the fertile floret equal, finely punctured, but not transversely wrinkled.

A weed in cultivated fields, gardens, and waste ground. Rather rare, and a doubtful native. Surrey, Norfolk, Suffolk, and perhaps Middlesex, appear to be the only counties in which it has any claim to be considered indigenous, although it casually occurs in many others. I have gathered it in Kent and Essex, as well as in the counties mentioned above, and possess specimens from Gloucester and Warwick.

England. Annual. Late Summer, Autumn.

Stems numerous, more or less geniculate, branched towards the base, erect or ascending, 3 to 18 inches high. Leaves 1 to 6 inches long by $\frac{1}{4}$ to $\frac{3}{4}$ inch broad, lively green with a paler midrib, with rather distant scabrous ribs and strongly scabrous margins. Ligule composed of a tuft of hairs. Panicle $\frac{1}{2}$ to 3 inches long. Bristles $\frac{1}{4}$ to $\frac{1}{2}$ inch long. Spikelets $\frac{1}{8}$ inch long.

Green Bristle-Grass.

French, *Sétaria vert.* German, *Grüner Fennich.*

This grass grows on sandy soils in some districts, and is in some countries a troublesome weed. It produces abundance of seed, of which small birds are very fond.

SPECIES II.—SETARIA VERTICILLATA. *Pal. de Beauv.*

PLATE MDCXCIV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXXVIII. Fig. 511.
Billot, Fl. Gall. et Germ. Exsicc. No. 1974.
Panicum verticillatum, *Linn.* *Sm.* Engl. Bot. ed. i. No. 874.

Panicle spikelike, cylindrical, rather dense, interrupted and broken up into whorls at the base, not lobed. Bristles of each spikelet 1 to 4, but commonly 2, equalling or slightly exceeding the spikelet, but never twice as long, rough with prickles pointing backward, green, often tinged with purple. Upper glume as long as the fertile floret. Upper pale of the male floret one-third the length of the lower, which about equals the fertile floret; pales of the fertile floret equal, finely punctured, but not transversely wrinkled.

In cultivated fields in Surrey and Norfolk, but scarcely sufficiently well established to be included in the British lists. Indeed I have heard of no well-authenticated notice of its occurrence, except as a weed in Chelsea Botanical Garden, since Battersea Fields were converted into Battersea Park.

[England.] Annual. Late Summer, Autumn.

Very similar to S. viridis, but taller and more slender, usually 1 to 2 feet high, the stems commonly more geniculate at the base, so that a single plant occupies a larger space than one of S. viridis. Leaves more distant, and commonly narrower. Panicle more slender, and when in fruit less compact, and the lower part of it has almost always some of the whorls slightly separated from each other and from the rest of the panicle. The bristles are shorter and fewer, but the most striking difference lies in the teeth of the bristles, which point backwards, and cause the panicle of S. verticillata to feel rough when drawn through the hand downwards.

Rough Bristle Grass.

These are introduced plants, and so generally so over a great part of the world that it is difficult to make out their original type or habitat, but they have probably travelled from the East to the West, following man as a tiller of the soil wherever he extends his localisation for this purpose. The confusion of the species is not greater than that of the genera in this group: Echinochloa, Panicum, Setaria, and others are often referred to the same genus.

TRIBE IV.—PHALARIDEÆ.

Spikelets closed during flowering, arranged in a dense cylindrical or ovoid spikelike panicle, rarely in a lax open panicle, not unilateral, laterally compressed, each containing a single perfect floret, with 1 or 2 inferior imperfect flowers, either scalelike and neuter, or more developed and male. Glumes equal, or the lower one shorter, but still very conspicuous, the upper one or both, as long as the florets. Pales closed during flowering, the lower one keeled, the upper one of the neuter flowers absent. Stamens 3, more rarely 2. Styles long; stigmas 2, protruded at the apex of the floret between the tips of the pales. Caryops laterally compressed, not furrowed.

GENUS VIII.—**HIEROCHLOE.** *Gmel.*

Spikelets stalked, arranged in a lax open or rarely contracted panicle, laterally compressed, biconvex, closed during flowering, each containing a single perfect floret, with 2 male florets beneath it. Glumes 2, equal, nearly as long as the floret, keeled, shining, denticulate or mucronate at the summit, but not awned, scarious. Pales 2, the lower one keeled, parchmentlike, sometimes awned below the summit, the upper one of the perfect flower with 1 keel, the upper one in the male flower with 2 keels. Lodicules 2, oblong, glabrous. Stamens 2 in the perfect, 3 in the male flowers. Styles 2, rather short; stigmas very long, thick, plumose, protruded at the apex of the flower. Caryops glabrous, free, oblong, slightly laterally compressed, not furrowed.

A genus so named from two Greek words, ἱερός, sacred, and χλόη, a grass,—holy grass—on account of its early use to strew in churches.

SPECIES I.—HIEROCHLOE* BOREALIS. *Röm. & Schultes.*

PLATE MDCXCV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXXIII. Fig. 500.
H. odorata, *Wahl.* *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 895.
Holcus odoratus, *Linn.* Sp. Plant. p. 1485.

Rootstock extensively creeping, with elongate stolons. Leaves flat. Panicle open during and after flowering, with capillary flexuous spreading branches. Pedicels wholly glabrous. Glumes acuminate. Pales of the male florets mucronate, that of the perfect floret acute.

In damp places by the sides of rivers and streams. Very local. Abundant by the river near Thurso, Caithness. Said to have been found by Mr. G. Don in Glen Cally, Forfarshire.

Scotland. Perennial. Late spring, early Summer (?).

Rootstock slender, whitish, throwing off stolons which produce in late summer and autumn leafy barren stems at a considerable distance from the parents. On these stems the leaves increase in length from the base upwards in garden specimens (for I have not seen wild examples of the barren stems), the longest about 1 foot long by $\frac{1}{4}$ inch broad, gradually tapering towards the apex, slightly glaucous above, and with close flattish ribs, which are rough with minute points, bright deep green, smooth and shining below, very rough on the margins; sheaths smooth; ligule membranous, parabolical. Flowering stems in the wild plant 6 to 15 inches high, the sheaths not extending above the middle; the uppermost lamina $\frac{1}{2}$ inch long, and the longest not above 2 inches; ligule much longer than broad, lanceolate. Panicle 1 to 2 inches long, the lower branches about half the length of the panicle, widely spreading. Florets drooping, $\frac{1}{6}$ inch long. Glumes shining, scarious, very pale green, tinged with purple. Pales of the male flower scabrous and slightly hairy, the lower one strongly ciliated on the margins, acuminate and mucronate, but the mucro is so short that it scarcely deserves the name of an awn. Pales of the fertile flower narrower than those of the male florets, more shining, and not scabrous. Plant with the scent of Anthoxanthum.

Professor Babington states that this plant flowers in July, and Dr. Hooker in May and June. In Balmuto Garden (originally from Thurso) it flowers in April.

Northern Holy Grass.

German, *Wohlriechendes Mariengras.*

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* Generally and properly spelt Hierochloa, but Gmelin, the author of the genus, writes it as given above.

This grass, dedicated to the Virgin Mary on account of its sweetness, is strewn about Catholic churches on festival days. It is called Vanilla Grass on account of its perfume, which latter, it would seem, is of the same kind as that of the Anthoxanthum odoratum, to which, indeed, it is not distantly allied.

GENUS IX.—**ANTHOXANTHUM.** *Linn.*

Spikelets persistent, subsessile or very shortly stalked, arranged in a rather dense spikelike panicle sometimes slightly interrupted towards the base, laterally compressed, slightly biconvex, closed during flowering, each containing a single perfect floret, with 2 neuter florets beneath it. Glumes 2, very unequal, the lower one smaller, keeled, scarious, pointed or mucronate, the upper one as long as or longer than the florets, keeled with 2 ribs besides the keel, subherbaceous, mucronate. Pales of the perfect floret 2, minute, rounded on the back, not awned, scarious; pale of the neuter florets 1, emarginate, awned about the middle or towards the base, the awn of the lower floret straight, of the upper one bent. Lodicules absent. Stamens 2. Styles rather long; stigmas very long, slender, hairy, protruded at the apex of the flower. Caryops glabrous, free, oval-oblong, slightly laterally compressed, not channelled.

The derivation of the name of this genus of Grasses is from ἄνθος, a flower, and ξανθός, yellow.

SPECIES I.—**ANTHOXANTHUM ODORATUM.** *Linn.*

PLATE MDCXCVI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXXII. Figs. 495 to 498.
Billot, Fl. Gall. et Germ. Exsicc. No. 1353.

Rootstock perennial. Panicle spikelike, rather dense, oblong-cylindrical or fusiform-cylindrical, continuous or more or less interrupted towards the base. Glumes about as long as the awns of the neuter floret.

Var. α, *genuinum.*

A. odoratum, *Dumort.* Agrost. Belg. p. 129. *Boreau*, Fl. du Centre de la Fr. p. 696.

Stem and glumes glabrous.

Var. β, *villosum.*

A. villosum, *Dumort.* Agrost. Belg. p. 129. *Boreau*, Fl. du Centre de la Fr. p. 697.

Stem glabrous or slightly scabrous. Glumes pubescent.

In meadows, pastures, woods, &c. Very common, and generally distributed. Var. β less common, but still very frequent.

England, Scotland, Ireland. Perennial. Early Summer to Autumn.

Rootstock tufted, not creeping, producing several or numerous stems. Stems simple, 8 inches to 3 feet high, erect, from a more or less geniculate base, smooth or sometimes slightly rough in var. β. Leaves of the autumnal barren shoots longer than those on the flowering stems, often 1 foot long, very similar to those of Hierochloe borealis, but with a longer ligule, dull, slightly glaucous green above, with numerous ribs and usually distant hairs, bright green, smooth and shining beneath where there is a strong keel as in Hierochloe borealis, but they are very slightly rough on the margins; uppermost stem-leaf ½ to 2 inches long (the lower ones a little more), with a long lanceolate ligule. Panicle 1 to 4 inches long, the larger examples with it more distinctly lobed and interrupted at the base than it is in the smaller. Spikelets very shortly stalked, ⅓ inch long, slightly spreading while in flower. Glumes varying from glabrous with a few ciliæ on the back to rather densely pubescent, pale yellowish-green. Pales of the neuter florets notched, both with an awn proceeding from near the middle of the back; that of the lower neuter floret considerably shorter than its pale; that of the upper about equalling it, and slightly bent. Pales of the fertile florets shorter than those of the neuter florets, and without any awn. Anthers purple or light yellow. Plant with the scent of woodruff when it is in process of drying, but not odorous when fresh like Hierochloe odorata.

Sweet-scented Vernal-Grass.

French, *Flouve odorante.* German, *Gemeines Ruchgras.*

This species is one of our most generally distributed pasture grasses, occurring on the most exposed mountain ranges, forming part of every natural meadow, and forming tufts in the more secluded woods. It is a grass which of all others gives the peculiar flavour to meadow hay. This exists in an aromatic principle known as *coumarin*, and is the same that exists in the Woodruff, the Melilot, and to a still greater extent in the celebrated Tonquin bean. To the Vernal Grass is due the sweeter scent, flavour, and relish of meadow hay when compared with artificial pasture. It is common throughout Europe and Asia, and has become naturalised in the New World by the transportation of our native grass seeds.

In rural economy it takes the place of lavender and other scented herbs, being collected in bunches and placed in the linen and clothes presses for the double purpose of imparting a sweet savour and of keeping away moth and other insects.

In laying down land for pastures, its seed should always form part of the mixed grasses, as it improves the flavour and doubtless the digestibility of both the pasture and the hay made therefrom. It is useless in shifting pastures, but in mixtures of grasses and clovers it is recommended that its place be supplied with a small quantity of the seeds of the yellow or white Melilot, which imparts the same quality; but failing this a sprinkling of bruised Fenugreek seeds sprinkled on the rick after every two or three loads is found to answer the same purpose. "Such flavoured hay," says Professor Buckman, "we have found in practice to be eaten with avidity, and to do more good than ordinary flavourless herbages."

One of the chief merits of this grass is its early growth, and the fact that it continues to vegetate and throw up flowering stalks till the end of autumn. Its hardy and permanent nature sufficiently upholds its claim to a place in the composition of all permanent pastures.

GENUS X.—**DIGRAPHIS.** *Trin.*

Spikelets persistent, shortly stalked, arranged in a long narrow rather dense panicle with short lateral branches spreading during flowering and adpressed afterwards, laterally compressed, closed during flowering, each containing a single perfect floret, with the minute scalelike rudiments of 2 neuter florets beneath it. Glumes 2, equal, longer than the floret, strongly keeled, but not evidently winged, each with 2 ribs in addition to the keel, mucronate, parchmentlike. Pales of the perfect floret 2, faintly keeled, pointed but not awned, the lower one ultimately cartilaginous and a little larger than the upper; pale of the neuter florets 1, very minute, scarious, not awned. Stamens 3. Styles 2, long; stigmas long, thick, plumose, protruded at the apex of the flower. Caryops glabrous, free, elliptical-oblong, laterally compressed, not channelled.

The derivation is from *δύω*, two, and *γραφίς*, a style.

SPECIES I.—**DIGRAPHIS ARUNDINACEA.** *Trin.*

PLATE MDCXCVII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXXI. Fig. 403.
Billot, Fl. Gall. et Germ. Exsicc. No. 2162.
Baldingera arundinacea, *Dumort.* Agrost. Belg. p. 130. *Reich.* Ic. l. c. p. 65.
B. colorata, Fl. Wett. No. 99.
Phalaris arundinacea, *Linn.* *Sm.* Engl. Bot. ed. i. p. 402, et *Auct. Plur.*
Calamagrostis colorata, *D.C.* Fl. Fr. Vol. III. p. 26.
Arundo colorata, *Willd.* Sp. Plant. Vol. I. p. 457.

The only known species.

In ditches and wet places. Common, and generally distributed.

England, Scotland, Ireland. Perennial. Summer.

Rootstock shortly creeping. Stems erect, simple,* or with barren branches towards the base, 2 to 5 feet high, smooth. Leaves 6 inches to 1 foot long by $\frac{5}{8}$ to 1 inch broad, with a short membranous ligule. Panicle 4 to 7 inches long, open at the time of flowering, afterwards contracted, the longest branches about 2 inches long, bare of spikelets for about $\frac{1}{5}$ inch, the uppermost branches with spikelets nearly to the base. Spikelets about $\frac{1}{4}$ inch long, green, or tinged with reddish-purple. Lowest glumes 3-ribbed, gradually acuminated. Pales a little shorter than the glumes, glabrous, shining, ciliated, with 2 pilose scalelike barren florets at the base, about half the length of the pales.

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* In describing the stems of grasses when the term "branched" without explanation is used, it signifies that the stems have branches terminated by inflorescence.

A variety with the leaves striped with white is common in gardens under the name of "Ribbon Grass," or "Gardener's Garters."

Ribbon Grass.

German, *Glanzgras.* French, *Baldingere colorée.*

This grass is generally distributed in sluggish rivers, pond sides, and marshy places, in all of which the sportsman welcomes it as a covert for water-fowl.

The Variegated Ribbon or Striped Grass of our gardens is a variety of a more dwarf habit and less tendency—like all albino-foliaged plants—to flower. A still more dwarf tufted variety, even less disposed to flower, is for these qualities much employed in modern ribbon borders.

GENUS XI.—**PHALARIS.** *Linn.*

Spikelets persistent or deciduous, subsessile, arranged in a very dense ovoid or subcylindrical spikelike panicle, laterally compressed, closed during flowering, each containing a single perfect floret, with the minute scalelike rudiments of 2 neuter florets beneath it, or sometimes of only 1. Glumes 2, equal, longer than the floret, with a strong keel bearing a wing, which is most developed beyond the middle, each with 2 ribs in addition to the keel, apiculate or mucronate, parchmentlike. Pales of the perfect floret 2, faintly keeled, pointed, but not awned; the lower one ultimately cartilaginous and a little larger than the upper; pale of the neuter florets 1, very minute, scarious, not awned. Stamens 3. Styles 2, very long; stigmas long, thick, plumose, protruded at the apex of the floret. Caryops glabrous, free, elliptical-oblong, laterally compressed, not channelled.

The name of this genus comes from the Greek word φαλός, white, or splendid, from its white shining seed; supposed to be the φαλαρίς of Dioscorides.

SPECIES I.—**PHALARIS CANARIENSIS.** *Linn.*

PLATE MDCXCVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXXI. Fig. 491.
Billot, Fl. Gall. et Germ. Exsicc. No. 1875.

Annual. Stems erect, generally branched from the base, not swollen at the base, leafy for three-quarters of their length. Panicle very dense, spikelike, ovate-ovoid or oblong-ovoid. Spikelets persistent. Glumes half-elliptical, white, with a green band at the origin of the keel, and another parallel to the inner margin over the 1 or 2 ribs; wing of the keel commencing near the base and terminating at the apex, broadest about one-fourth from the apex, where it is more than half the width of the glume, white, finely serrulate on the margin. Barren florets linear, half as long as the fertile flower, ciliated.

In waste places near towns, and the borders of fields where it has been cultivated; indeed, were it not for cultivation, cleaning of bird-cages, and professional bird-catching, the plant would no doubt disappear from Britain, so it has little claim to be considered as a properly naturalised plant.

[England, Scotland, Ireland.] Annual. Late Summer, Autumn.

Stems 1 to 3 feet high. Leaves 3 to 6 inches long by $\frac{1}{4}$ to $\frac{3}{4}$ inch broad, the uppermost sheath greatly swollen and forming a spathe in which the young panicle is included, but ultimately the panicle is exserted for about twice the length of the uppermost sheath. Panicle 1 to 2 inches long by about $\frac{3}{4}$ inch broad. Spikelets $\frac{1}{4}$ inch long. Pales a little shorter than the glumes, at first green, ultimately shining, coriaceous, and light brown, closely investing the seed, and in this state constituting the "canary seed" so much used by bird-fanciers, for which the plant is cultivated as a crop in many places in the south of England, especially in Kent.

Canary-Grass.

German, *Kanarien-Hirse.*

This species is a native of southern Europe, and is now naturalised in several positions on the Continent and in the neighbourhood of our larger towns. Its use as food for canaries and other pet birds, by whom its seeds are greatly relished, has caused its occasional cultivation in the southern counties, whilst town refuse has aided its spread on the manure heap, in waste places, and about gardens.

TRIBE V.—PHLEINEÆ.

Spikelets closed during flowering, arranged in a dense cylindrical or ovoid spikelike panicle, not unilateral, laterally compressed, each containing a single perfect floret, rarely with the rudiment of one reduced to a pedicel above it. Glumes nearly equal, as long as the flowers. Pales 2, the lower one keeled. Stamens 3. Styles long or short; stigmas 2, protruded at the apex of the floret between the tips of the pales. Caryops laterally compressed, not furrowed.

GENUS XII.—ALOPECURUS. *Linn.*

Spikelets very shortly stalked, articulated to the pedicles, deciduous, arranged in a very dense cylindrical or fusiform or ovoid spikelike panicle, laterally compressed, plano-convex, closed during flowering, each containing a single perfect floret, without any rudiment of a second. Glumes 2, equal, longer than the florets, keeled, acute, or obtuse, not awned, often more or less connected at the base, subherbaceous. Pale 1, keeled, with 2 ribs on each side besides the keel, usually with a dorsal awn, scarious. Lodicules absent. Stamens 3. Styles 2, long or short, often more or less united; stigmas long, rather thick, hairy, protruded at the apex of the floret. Caryops glabrous, free, elliptical and laterally compressed, not channelled.

The name of this genus comes from the Greek word ἀλώπηξ, a fox, and *οὐρά*, a tail.

SPECIES I.—ALOPECURUS AGRESTIS. *Linn.*

PLATE MDCXCIX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXVIII. Fig. 473.
Billot, Fl. Gall. et Germ. Exsicc. No. 476.

Annual. Stems erect, scarcely geniculate, branched from the lower knots. Leaves thin, with rather few and distant broad slightly-raised ribs, pale green, not glaucous. Panicle narrowly cylindrical-fusiform, gradually attenuated and acute at the base and at the apex; panicle-branches each with a single spikelet. Spikelets oval-elliptical. Glumes united nearly to the middle, converging at the tips, parchment-like, acuminate, glabrous; keel slightly winged, ciliated with long hairs on the lower half, and with very short ones above the middle. Awn from near the base of the pale, and nearly as long again as the glumes. Anthers linear.

In cultivated fields and in waste places, particularly in sandy soil, common in the south of England, but becoming scarce in the north. Not even naturalised in Scotland, where it is occasionally found on ballast hills, or in fields to which it has been introduced with seed brought from more southern localities. The authors of the "Cybele Hibernica" say it is not naturalised in Ireland.

England. Annual. Early Summer to late Autumn.

Stems 1 to 2½ feet high, slender, very slightly scabrous; leafy for about two-thirds of their length upwards, with branches ending in panicles from the lowest nodes in all but weak stems. Barren shoots none. Sheaths slightly rough, the lower ones shorter than, the upper ones longer than their leaves. Ligule prominent, rather blunt, longer than the diameter of the stem. Longest leaves 3 to 4 inches long by ¼ inch broad; the uppermost leaves, especially on the branches, under an inch long. Panicle 1 to 4 inches long, more lax than in any of the other British species of Alopecurus. Glumes, exclusive of the awn, about ¼ inch long, green, with darker bands along the ribs, ultimately usually tinged with red or purple on the outside, and often with a purplish-brown spot at the apex. Keel of the glumes broadest about one-fourth from the apex, and narrowing off from that point both to the apex and to the base, where it disappears. Awns slender, rough, exserted for about the length of the spikelet. Anthers yellowish-white or purple.

The stems sometimes, when growing in barren ground, are slightly decumbent and geniculate at the base, but the habit of the stems resembles that of the canary-grass more than it does the other species of Alopecurus.

Slender Fox-tail Grass.

French, *Vulpin des champs.* German, *Acker-Fuchsschwanz.*

This is an agrarian species, well known, under the name of Black Grass, as a common and detested weed in the poor exhausted arable field.

SPECIES II.—ALOPECURUS PALUSTRIS.

PLATES MDCC. MDCCI. MDCCII.

Perennial. Stems more or less geniculate, usually decumbent, and often rooting at the basal joints, simple or branched from the lower knots. Leaves thin, with numerous distant slightly-raised ribs, or rather thick, with a few greatly-raised ones, green, usually slightly glaucous. Ligule prominent, longer than broad. Panicle cylindrical or fusiform-cylindrical; panicle branches with 2 to 7 florets. Spikelets oblong. Glumes united only at the very base or entirely free, obtuse or acute, more or less divergent at the apex, more or less pubescent; keel not winged, ciliated with long hairs throughout, or rarely only in the lower half. Awn from near the middle or the base of the pale, as long as, or twice as long as the glumes. Anthers broadly or narrowly oblong.

SUB-SPECIES I.—**Alopecurus fulvus.** *Sm.*

PLATE MDCC.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXVIII. Fig. 476.
Billot, Fl. Gall. et Germ. Exsicc. No. 2165.

Stems geniculate, decumbent and rooting at the base, floating or more rarely terrestrial, the lower joints slender or slightly swollen, simple or branched from the lower knots. Leaves thin, with numerous close broad slightly-raised slightly-rough ribs, pale green, slightly glaucous. Panicle narrowly-cylindrical, rounded at the base and apex, frequently slightly attenuated towards the apex; panicle-branches mostly with 2 to 4 spikelets. Spikelets oval-oblong. Glumes united only at the very base, obtuse, almost truncate, membranous, pubescent, a little shorter than the pales, pale green, with darker green stripes; keel not winged, ciliated with long stiff hairs throughout. Awn from a little below the middle of the pale and extending very little beyond the glumes. Anthers shortly-oblong, orange-scarlet or yellowish-white.

In shallow pools, splashes, and ditches; very rarely on the ground. Local, and confined to the southern half of England, excluding apparently the south-west, reaching to Norfolk, from whence the specimen figured in the first edition of "English Botany" was obtained; Kenilworth, Warwickshire (Mr. H. Bromwich); Oakmere, Cheshire (Mr. C. Bailey); and Denbigh. Said to have been found by Don in Fife and Forfar, but these counties cannot be included in its distribution until they have been confirmed.

England. Perennial. Early Summer to Autumn.

Stems numerous, more or less decumbent at the base and geniculate, sometimes with the lower joints slightly thickened, 6 to 18 inches long, the uppermost leaf near the panicle and sometimes quite close to it: when floating, the barren shoots are sometimes 2 or 3 feet. Leaves 1 to 3 inches long, $\frac{1}{8}$ to $\frac{1}{4}$ inch broad. Sheaths smooth, the uppermost one considerably swollen. Ligule prominent, lanceolate, blunt. Panicle $\frac{3}{4}$ inch to $2\frac{1}{2}$ inches, pale green without any purple tinge. Spikelets $\frac{1}{12}$ inch long, ovate-oblong. Glumes a little shorter than the pales, pale green, with a darker stripe on each side of the keel, and another near the inner margin. Awn sometimes scarcely exceeding the pales, and never exceeding them by more than a quarter of their length. Anthers orange-scarlet in all the specimens I have seen growing wild; but in the plant I have in cultivation, they are yellowish-white, and never become scarlet.

Mr. H. C. Watson says the plant is annual on dry ground in his garden at Thames Ditton. Grown in water at Balmuto, it is perennial.

Orange-anthered Foxtail Grass.

French, *Vulpin fauve.* German, *Rothgelber Fuchsschwanz.*

Sub-Species II.—**Alopecurus geniculatus.**

Plate MDCCI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXVIII. Fig. 472.
Billot, Fl. Gall. et Germ. Exsicc. No. 2164.

Stems geniculate, decumbent and usually rooting at the base, floating or terrestrial, the lower joints slender or rarely slightly swollen, simple, branched from the lower knots. Leaves thin, with numerous close broad slightly raised rough ribs, dull green, slightly glaucous. Panicle cylindrical, rounded at the base and apex, not tapering more towards the apex than the base; panicle-branches mostly with 2 to 4 spikelets. Spikelets oblong. Glumes united only at the very base, subacute, as long as the pales, membranous, pubescent, pale green, with a lead-coloured or more rarely green stripe on each side of the keel, and another at the apex, parallel to the inner margin; keel not winged, ciliated with long silky hairs throughout. Awn from below the middle of the pale and nearly as long again as the glumes. Anthers narrowly oblong, yellowish-white or purple, changing to orange-brown.

In meadows and wet places, and occasionally floating in the water in ponds and ditches. Common, and generally distributed.

England, Scotland, Ireland. Perennial. Early Summer to Autumn.

Stems 3 to 18 inches long, geniculate, the last joint beneath the panicle erect; lowest joint sometimes slightly swollen, when it has been mistaken for A. bulbosus. Leaves similar to those of A. fulvus, but darker green, and with ribs furnished with asperities raised into short prickle-like hairs, while in A. fulvus there are merely raised points. Panicle 1 to 2½ inches long, thicker in proportion to its length than that of A. fulvus, less tapering, darker coloured, from the purplish or lead-coloured markings which are commonly present on the glumes. Spikelets $\frac{1}{10}$ inch long, exclusive of the awn, which is commonly nearly as long as, and sometimes even longer than the spikelet. Glumes longer in proportion to the pales than in A. fulvus, much less obtuse, indeed appearing acute when they are viewed as they appear on the plant without opening them out: some authors describe them as blunt, but these no doubt describe the form of the glume when its two sides are separated and kept apart. Awn from lower down on the back of the pale, and greatly extending beyond it, by which, even at a superficial glance, it may be known from A. fulvus. Anthers at least twice as long as broad, and never of the bright orange-scarlet colour which is so conspicuous in A. fulvus.

The characters which separate this A. geniculatus from A. fulvus are certainly slight, but they appear to be quite constant. Both Mr. H. C. Watson and myself have raised A. fulvus from seed, and find it retains its characters, such as they are.

A. pronus (*Mitten*) I have always understood to be a form of A. geniculatus, with the stems not geniculate. Dr. Hooker, however, in the "Student's Flora," says, it is a "prostrate form" of A. pratensis. As I have not seen the plant, I am unable to offer any opinion. The Rev. W. W. Newbould informs me that from a casual examination of the specimens, named A. pronus, in Mr. Borrer's Herbarium at Kew, he is inclined to think that there is either a mixture of specimens of A. geniculatus and A. pratensis, or that they are hybrids. If the latter be the case, probably A. pronus is the same as A. pratensis-geniculatus *Wichura* (A. hybridus, *Wimmer*), mentioned in Garcke's "Flora of Nord- und Mittel-Deutschland" (ed. vi. p. 438), of which I have specimens from Bremen, collected by Dr. Focke.

Bent-stemmed Foxtail-Grass.

French, *Vulpin genouillé.* German, *Geknieter Fuchsschwanz.*

SUB-SPECIES III.—**Alopecurus bulbosus.** *Linn.*

PLATE MDCCII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXVIII. Fig. 474.
Billot, Fl. Gall. et Germ. Exsicc. No. 1355.

Stems usually more or less geniculate, erect, or decumbent but not rooting at the base, terrestrial, simple, the lowest joints swollen into an ovoid corm tapering upwards. Leaves rather thick, with numerous close broad prominent slightly rough cartilaginous ribs, pale green, slightly glaucous. Panicle fusiform-cylindrical, abruptly pointed at the base and apex, broadest in the middle; panicle-branches mostly with 1 or 2 spikelets. Spikelets narrowly oblong. Glumes free to the very base, acuminate and shortly mucronate, as long as the pales, somewhat parchmentlike, thinly pubescent, pale green, with a dark lead-coloured stripe on each side of the keel, and another parallel to the inner margin at the apex; keel not winged, ciliated (as are also the ribs) with long silky hairs in the lower half and shorter ones in the apical half. Awn from near the base of the pale, and nearly as long again as the glumes. Anthers narrowly oblong, yellowish-white or purple, changing to orange-brown.

In salt marshes and meadows, pastures, and waste ground near the sea. Local but widely distributed round the coast of the southern half of England, extending north to Cuerdley Marsh, near Warrington, and Clifton Ings Meadows, near York. In Ireland it is said to have been found by Mr. Drummond near Douglas, Cork, but has not been observed recently.

England. Perennial. Early Summer.

Extremely similar to A. geniculatus, but with the base of the stems swollen into bulblike corms. The lower joints of the stem are never rooting, the stem is more slender and usually less geniculate, and the upper leaf commonly much further from the panicle than in A. geniculatus. The leaves are narrower and have more prominent nerves than in A. geniculatus, and are commonly channelled. The panicle, which is $\frac{3}{4}$ to 2 inches long, is more slender and more fusiform than that of A. geniculatus; the spikelets are narrower, but rather longer ($\frac{1}{7}$ inch). The glumes are much more acuminate, shortly mucronate, and are clothed with fewer and shorter hairs; the keel and ribs on the glumes have long hairs, at least in the lower part, but not so long as those on the keel of A. geniculatus.

I have never gathered A. bulbosus, but Mr. F. Stratton has sent me numerous fresh specimens from Brading, Isle of Wight, some of which I have in cultivation.

I am still in some doubt if A. fulvus, A. geniculatus, and A. bulbosus ought to be considered merely as subspecies of one super-species. Dr. Bromfield, in "Phytol.," ser. i. vol. iii. p. 1080, says, "I cannot rid my mind of the impression that A. bulbosus and fulvus are but states or perhaps permanent varieties of A. geniculatus, much as I should wish to be convinced to the contrary by the many and able botanists who still keep them apart." And the Messrs. Paget, in the "Nat. Hist. of Yarmouth," say of A. fulvus, geniculatus, and bulbosus, that they "may be traced into one another by the closest and most regular gradations." I quote the last remark from the "Cybele Britannica," not having access to the above-named work.

Tuberous Foxtail-Grass.

SPECIES III.—ALOPECURUS PRATENSIS. *Linn.*

PLATE MDCCIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXVIII. Fig. 478.
Billot, Fl. Gall. et Germ. Exsicc. No. 1354.

Perennial. Rootstock oblique with very short stolons. Stem not geniculate, erect, not rooting at the base, simple. Leaves thin, with numerous slightly prominent slightly rough ribs, pale green, scarcely glaucous; ligule short, blunt. Panicle broadly fusiform-cylindrical, abruptly rounded at the base and apex, broadest about the middle; panicle-branches with 3 to 8 spikelets. Spikelets narrowly oblong-elliptical. Glumes united at the base for about one-fifth to one-fourth of their length, converging at the tips, gradually acuminate and acute, as long as the pales, somewhat parchmentlike, thinly pubescent, pale greyish-green, with a dark green stripe on each side of the keel, and another parallel to the inner margin extending nearly to the base; keel not winged, ciliated (as are also the ribs) with long silky hairs throughout. Awn from below the middle of the pales, and about as long again as the glumes. Anthers narrowly oblong, yellowish-white or purple, changing to orange-brown.

In meadows and pastures, and by roadsides, &c. Very common, and universally distributed.

England, Scotland, Ireland. Perennial. Early Summer.

Cæspitose, producing very short stolons, which send up barren shoots at a short distance from the parent. Stems 2 to 4 feet high, rather stout, the uppermost leaf ultimately at a considerable distance below the panicle. Leaves of the barren shoots 9 to 18 inches long by $\frac{1}{6}$ to $\frac{3}{8}$ broad; those of the flowering stem shorter, the uppermost stem-leaf sometimes not more than 1 inch long; sheaths smooth; ligule blunt, about as long as broad. Panicle 1 to 3 inches long by $\frac{1}{4}$ to $\frac{1}{2}$ inch broad. Spikelets $\frac{1}{5}$ inch long, exclusive of the awn.

Professor Babington states that "in salt marshes the base of the stem becomes fleshy, and the plant may be taken for A. bulbosus."

Meadow Foxtail-Grass.

French, *Vulpin des prés.* German, *Wiesen-Fuchsschwanz.*

This species is abundant in all meadows, where it is an extremely valuable pasture grass, being relished by all cattle, and yielding a good crop of stems and foliage; and on stiff soils is perhaps the most productive of all our native species, but is perhaps not so well adapted for hay as for pasture on account of the stems being few. Mr. Sinclair shows, in his "Hortus Gramineus," that its produce is nearly three-fourths greater on a clayey loam than on a sandy soil, and that the quantity of nutritive matter is also greater in the proportion of three to ten. It does not arrive at maturity till the fourth year after the seeds are sown, hence it is inferior to many grasses for the purposes of the alternate cropping. It flowers from the end of April to the latter end of June, and in marsh lands always yields a good second crop of leaves if mown early in the summer; indeed, according to Sinclair, the after math of this grass is generally far superior in value to the crop cut while it is in flower.

Some of the best meadows are chiefly composed of the foxtail, rye-grass, whitebent, and rough meadow grasses, and on rich low-lying lands no better combination could be formed. This is a common grass in rich meadows in the United States, having been introduced from Europe.

SPECIES IV.—**ALOPECURUS ALPINUS.** *Linn.*

PLATE MDCCIV.

Perennial. Rootstock oblique, with short or long stolons. Stem scarcely geniculate, erect, not rooting at the base, simple. Leaves thick, with a few very prominent slightly rough cartilaginous ribs, bright green, not glaucous; ligule short, blunt. Panicle oblong-cylindrical, subtruncate at the base, abruptly rounded at the apex, broadest near the base; panicle-branches with 2 to 6 spikelets. Spikelets oval-oblong. Glumes united at the base for about one-fourth of their length, subconnivent at the tips, gradually acuminate and acute, as long as the pales, submembranous, densely or thinly silky-pubescent, greenish-white, with a dark green or dark purple narrow stripe on each side of the keel, and another parallel to the inner margin extending nearly to the base; keel not winged, ciliated (as are also the ribs) with very long silky hairs throughout. Awn absent, or from a little below the middle of the pale, and extending beyond the glumes for about half their length, and often much less. Anthers oblong, yellowish-white.

Var. α, *genuinus.*

Panicle compact. Glumes slightly connivent, rather abruptly acuminate, marked with green or greenish-black lines, rarely tinged with purple. Awn absent, or if present scarcely extending beyond the glumes.

Var. β, *Watsoni.*

Panicle rather lax, usually longer than that of var. α. Glumes connivent at the tips, more gradually acute than those of var. α, with lead-coloured or purple lines, and frequently also tinged with purple. Awn extending beyond the glumes for one-third or one-fourth of their length.

In wet places on mountains. Local. Not unfrequent in the glens of the Clova Mountains, reaching up to Canlochan Glen, Forfar. Abundant on Loch-na-gar, and sparingly above Loch Kander, at the head of Glen Callater; in which county it is said to occur also on Ben-mac-dhui, and Braeriach. I possess a specimen with the label "Ben Lawers, W. H. Campbell," but I never could find the plant on that mountain, though I searched for it carefully. In the "Cybele Britannica," Ross and Moray are given as counties in which it occurs, but I have not seen specimens from either. Var. β, Canlochan Glen (Mr. H. C. Watson); above Loch Kander, head of Glen Callater, and on Loch-na-gar, growing with var. α.

Scotland. Perennial. Summer, Autumn.

Var. α has the stems 6 to 18 inches high. Leaves of the barren shoots 4 to 9 inches long, those of the flowering stem considerably shorter, and about $\frac{1}{4}$ inch broad, differing from those of A. pratensis in the very greatly elevated ribs above and glossy smoothness beneath. Spike $\frac{3}{4}$ to $1\frac{1}{4}$ inch long, very silky from the long white hairs on the margins of the glumes. Spikelets $\frac{1}{6}$ inch long.

Var. β shows some approach towards A. pratensis. Some of my Glen Callater specimens are 2 feet high with the spike $1\frac{1}{2}$ inch long. Spikelets $\frac{1}{5}$ inch long, the glumes more gradually acuminate and acute, and more connivent at the tips than in var. α, and the awn purple and about half as long as the spikelet. The leaves, however, are precisely similar to those of A. alpinus, var. α, and very different from those of A. pratensis and the continental A. nigrescens (*Horn*).

Alpine Foxtail-Grass.

GENUS XIII.—**PHLEUM.** *Linn.*

Spikelets persistent, subsessile, arranged in a very dense cylindrical or ovoid spikelike panicle, laterally compressed, nearly flat on each face, closed during flowering, each containing a single perfect floret, in some species with the rudiment of a second neuter one above it. Glumes 2, equal, longer than the florets, keeled, obliquely truncate or acuminate, mucronate or awned, parchmentlike. Pales 2, scarious, the lower one keeled, truncate and irregularly toothed at the apex, 3- or rarely 5-ribbed, rarely awned; the upper one with 2 approximate keels. Lodicules 2, bilobed. Stamens 3. Styles 2, rather long, or short; stigmas long, thick, plumose, protruded at the apex of the floret. Caryops glabrous, free, ovoid, laterally compressed, not channelled.

Name from the Greek, φλέως, the name of the *Saccharum cylindricum*, Lam. (See *Fraas.* "Synopsis," p. 299.)

SPECIES I.—**PHLEUM ALPINUM.** *Linn.*

PLATE MDCCV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXIX. Fig. 484.
Billot, Fl. Gall. et Germ. Exsicc. No. 1358.

Perennial. Rootstock shortly creeping, oblique, with short stolons. Stems erect from a more or less curved base, simple. Leaves flat, with numerous nearly equal elevated smooth ribs, dull green, slightly glaucous; sheaths smooth, the uppermost more or less inflated; ligule short, about as long as broad, obtuse. Panicle varying from ovoid to oblong-cylindrical, abruptly rounded at the base and apex, very dense. Spikelets spreading, oblong, with the sides straight and parallel in the upper half. Glumes truncate, terminating in a slightly diverging awn, which is as long as the glumes; keel and sometimes the scabrous awn ciliated with long stiff hairs. Lower pale 3-ribbed. Rudimentary floret absent.

In marshy places on mountains. Local. Not unfrequent in the glens of the Clova Mountains, Forfarshire. I gathered it in 1851 very sparingly on Ben Lawers, Perthshire, and abundantly on Loch-na-gar and Cairn-towl, Aberdeenshire; in this county it is also reported on good authority from the watercourse, Loch Kander, at the head of Loch Callander, Ben Avon, Ben-mac-dhui, Ben-a-buird, and Braeriach. It is also said to have been found by Dickson on Garvay Moor, Inverness-shire; but Dickson's stations are not to be trusted.

Scotland. Perennial. Autumn.

Stem 3 to 18 inches high, usually more or less curved at the base. Leaves 3 to 5 inches long, $\frac{1}{8}$ to $\frac{1}{4}$ inch broad, gradually tapering to the point, rough on the edges; the uppermost one $\frac{1}{2}$ to 1 inch long, much shorter than its sheath, which is slightly swollen. Panicle $\frac{1}{2}$ to 2 inches long. Spikelets (exclusive of the awn) $\frac{1}{6}$ inch long. Glumes parchmentlike, rounded-truncate at the apex, green on the back, more or less tinged with purple towards the edges and apex, ciliated with very long hairs on the keel, each one terminated by a long rough awn, which is without ciliæ, except at the very base.

In the typical Phleum alpinum of Scandinavia the awn is more or less ciliated; but in all the British specimens the awn is simply scabrous, or with a few ciliæ at the base: this form is identical with the Swiss plant named Phleum commutatum by Gaudin, which by general consent is now sunk under Phleum alpinum, *Linn.* The form of the panicle and inflation of the upper sheath vary so much that they are worthless as distinctive characters.

Alpine Timothy-Grass.

French, *Fléole des Alpes.* German, *Gebirgslische.*

SPECIES II.—**PHLEUM PRATENSE.** *Linn.*

PLATES MDCCVI. MDCCVII.

Perennial. Rootstock short, cæspitose, not creeping. Stems erect, straight, or slightly decumbent and geniculate at the base which is sometimes swollen into a cormlike enlargement, simple. Leaves flat, with numerous slightly elevated and slightly rough ribs, 3 to 7 of which are stronger than the others, pale green, very slightly glaucous; sheaths smooth, the uppermost one scarcely inflated; ligule short, about as long as broad. Panicle cylindrical or fusiform-cylindrical or ovoid, abruptly rounded at the base and apex, very dense. Spikelets spreading, narrowly oblong, with the sides straight and parallel towards the apex. Glumes truncate, terminating in an erect scabrous awn, about half as long as the glumes; keel ciliated with long stiff hairs, the cilia ceasing a little way below the awn. Lower pale 3-ribbed. Rudimentary floret absent.

Var. α, *genuinum.*

PLATE MDCCVI.

P. pratense and P. intermedium, *Jord.* *Bor.* Fl. du Centre de la Fr. ed. iii. Vol. II. p. 693.
Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXIX. Fig. 482.
Billot, Fl. Gall. et Germ. Exsicc. No. 2759.

Stem erect, scarcely geniculate and rarely swollen at the base. Leaves broad. Spike thick, long, cylindrical. Glumes pale greenish, with a darker keel.

Var. β, *nodosum.*

PLATE MDCCVII.

Reich. Ic. l. c. Tab. CLXXIX. Fig. 453.
Phleum nodosum, *Linn.* Spec. Pl. p. 88.
P. præcox and P. serotinum, *Jord.* *Bor.* Fl. du Centr. de la Fr. ed. iii. Vol. II. p. 693.

Stems more or less decumbent below, geniculate and often swollen at the base. Leaves rather narrow. Spikes slender, usually more or less fusiform or ovoid. Glumes nearly white, with green keels, and often slightly tinged with purple.

Common, and universally distributed in England and the south of Scotland. More rare in the north, and probably introduced in the Hebrides, Orkneys, and Shetlands. Not abundant in Ireland. Var. β in dry places, common; but I do not possess specimens from any county north of Fife, though this is no reason for supposing that it does not occur further north.

England, Scotland, Ireland. Perennial. Summer.

Var. α has the stems 18 inches to 3 feet high, or even more, the longest stem-leaves 4 inches to 1 foot long by $\frac{3}{8}$ to $\frac{1}{2}$ inch broad. Panicle 2 to 6 inches long. Glumes, exclusive of the awn, $\frac{1}{8}$ inch long. Anthers usually purple.

Var. β has the stem 4 to 20 inches long, the longest stem-leaves 1 to 3 inches long by $\frac{1}{8}$ to $\frac{1}{4}$ inch broad. Panicle $\frac{3}{8}$ inch to 2 inches long, and much more slender than that of var. α, but though the extremes appear widely different, they are completely connected by intermediate forms. Anthers usually yellowish-white in var. β.

Common Timothy-Grass.

French, *Fléole des prés.* German, *Timothee-Gras.*

It is stated that this grass was first recommended for agricultural use about twenty years ago under the name of Timothy grass, an appellation it received from Timothy Hanson, who cultivated it on a considerable scale for agricultural purposes in North America. It is a hard coarse grass, not much liked by horses, goats, cows, or sheep, and swine refuse it.

It is used as a shifting grass crop in Canada, where on the shores of the lakes we have seen immense crops as tall as wheat with spikes quite half a foot long.

It is not used as a self-grass in England, as it is too long in coming to perfection ; but it is the chief source of the rough but nutritious winter fodder in some of the States, where natural meadow does not yield the herbage that it does at home.

Timothy grass has been highly recommended for the purpose of hay, as the stems during the time the seeds are ripe contain more nutritive matter than that of most other grasses, but the deficiency in the produce of the after-math and the slowness of its growth after being cut are defects which are not compensated by the superior quantity of nutritive matter in the stems of the seed crop. Mr. Sinclair therefore considers it unfit for cultivation by itself as a husbandry grass, but of great value as a constituent of any mixture of grasses for permanent pasture, or the alternate husbandry, where it should always form a part of the crop. It grows best in most tenacious soils, and is common throughout the whole of Britain.

SPECIES III.—PHLEUM BOEHMERI. *Schrad.*

PLATE MDCCVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXX. Fig. 487.
Billot, Fl. Gall. et Germ. Exsicc. No. 1357.
P. phaleroides, *Köl.* *Fries*, Summ. Veg. Scand. p. 81.
P. læve, "*M. Bieb.*" *Dumort.* Agrost. Belg. p. 131.
Phalaris phleoides, *Linn.* *Sm.* Eng. Bot. ed. i. p. 459.
Chilochloa Böhmeri, *Pal. de Beauv.* *Reich.* l. c. p. 64.

Perennial. Rootstock short, cæspitose, scarcely creeping, but with scaly stolons. Stems erect from a slightly curved or indistinctly geniculate slender base, simple. Leaves flat, with numerous slightly elevated scabrous ribs, of which 5 to 7 are stronger than the others, dull green, glaucous; sheaths rough, the uppermost one scarcely inflated; ligule short, truncate. Panicle cylindrical or fusiform-cylindrical, attenuated at the base and slightly so at the apex, rather dense. Spikelets ascending, oblong-elliptical, with the sides curved throughout. Glumes abruptly acuminated into an erect scabrous awn less than one-fourth the length of the glumes; keel scabrous, ciliated with short distant hairs. Lower pale 3-ribbed. Rudimentary floret stalk-like.

In chalky and sandy fields. Very local. Bartlow Hills, Essex; Mildenhall and Kentford, Suffolk; Hardingham, Mundford, Beachanwell, Narborough, and Martham, Norfolk; Hildersham (close by the Essex station), Cambridgeshire, and formerly in several other stations in the same county; Hertfordshire. I have a specimen said to be collected in a chalk-pit near Rochester, Kent, by Mr. William McIvor in 1846: it is an extremely luxuriant one, leading one to suspect that the example is a cultivated one.

England. Perennial. Summer.

Plant growing in small tufts, producing numerous stems from 3 to 20 inches high. Leaves with rough ribs and very rough margins, those even of the barren shoots short, from 1 to 3 inches, the uppermost stem-leaf ½ to 1 inch long by ⅙ inch broad. Panicle ½ to 3 inches long (in Mr. McIvor's specimen 4½ inches). Spikelets, exclusive of the awns, ⅕ inch long, tapering from the middle to the apex, and not parallel-sided, as in P. alpinum and P. pratense. The glumes are studded with very minute raised points, not with very fine and distant hairs, as in P. alpinum and P. pratense.

Purple-stalked Timothy-Grass.

SPECIES IV.—**PHLEUM ARENARIUM.** *Linn.*

PLATE MDCCIX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXIX. Fig. 481.
Billot, Fl. Gall. et Germ. Exsicc. No. 477.
Phalaris arenaria, *Huds.* *Sm.* Eng. Bot. ed. i. No. 222.
Chilochloa arenaria, *Pal. de Beauv.* *Reich.* Ic. l.c. p. 64.

Annual. Stem erect or ascending from a curved or slightly geniculate slender base, simple, or branched at the base. Leaves flat, with numerous slightly elevated nearly smooth ribs, of which 5 to 7 are stronger than the others, pale green, slightly glaucous; sheaths smooth, the uppermost one slightly inflated; ligule long, lanceolate, acute. Panicle clavate-cylindrical or fusiform-cylindrical or ovoid, attenuated at the base, abruptly rounded at the apex, very dense. Spikelets erect, elliptical, with the sides curved throughout. Glumes very gradually acuminated into an erect scabrous awn or mucro, about one-eighth the length of the glumes; keel ciliated with long stiff hairs in the uppermost half or third. Lower pale 3-ribbed. Rudimentary floret stalklike.

On sandy pastures and loose sand by the sea, rarely inland. Not unfrequent upon the coast of England. Rather rare in Scotland, where it has been observed on the east coast as far north as the

Links at Rattray Head, Aberdeenshire, but there appears to be no record of its occurrence on the west coast, though it has been found in the Isle of Man. Local, but widely distributed in Ireland.

England, Scotland, Ireland. Annual. Early Summer.

Plant growing in small tufts. Stems 2 inches to 1 foot high, the outer ones in each tuft geniculate at the base, and generally branched, with the branches very short, and commonly about equal in length among themselves in each tuft: in consequence of this a tuft of the plant has one set of panicles near the ground and another raised considerably above it. Leaves very short, rarely 1 inch long, $\frac{1}{6}$ to $\frac{1}{4}$ inch broad, the uppermost stem-leaf $\frac{1}{4}$ to $\frac{3}{4}$ inch long, with a very long ligule, that of the lower leaves being shorter. Spikelets $\frac{1}{8}$ inch long. Glumes pale green with a dark green band on each side of the keel, the bristles in the upper part of which are white and shining; inner margins of the glumes furnished with a few bristles, shorter than those of the keel. Anthers yellowish-white.

Sand Timothy-Grass.

TRIBE VI.—SESLERIEÆ.

Spikelets closed during flowering, arranged in a dense cylindrical or ovoid or rarely unilateral spikelike panicle, slightly laterally compressed, each containing 2 to 13 perfect florets. Glumes equal, or the lower one shorter, but still very conspicuous. Pales 2, conspicuous, the lower one not keeled. Stamens 3. Styles short; stigmas 2, very long, protruded at the apex of the floret between the tips of the pales. Caryops subcylindrical, not furrowed, or with a furrow on the inner face.

GENUS XIV.—**SESLERIA.** *Scop.*

Spikelets sessile or subsessile, arranged in a very dense cylindrical or ovoid spikelike panicle, laterally compressed, closed during flowering, containing 2 to 6 flowers. Glumes 2, nearly equal, shorter than the florets, or nearly equalling them, keeled, mucronate or awned, subscarious. Pales 2, the lower one rounded on the back, 5-ribbed, with 3 or 5 of the ribs terminating in mucros or short setæ, parchmentlike; upper pale with 2 keels, bifid at the apex, scarious. Lodicules 2, oblong, entire or 2- to 5-cleft. Stamens 3. Styles 2, very short, often united; stigmas very long, slender, pubescent, protruded at the apex of the floret. Caryops pubescent at the apex, free, oblong, dorsally compressed, convex on the back, flat and not furrowed, but with a basal impression on the face.

Named after Leonard Sesler, an Italian botanist.

SPECIES I.—**SESLERIA CÆRULEA.** *Scop.*

PLATE MDCCX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXVIII. Fig. 444.
Billot, Fl. Gall. et Germ. Exsicc. No. 479.
Cynosurus cæruleus, *Linn.* Sp. Pl. p. 106.

Rootstock not stoloniferous. Leaves long, flat, parallel-sided, abruptly pointed and terminated by a very short mucro. Panicle spikelike, short, ovoid or oblong, rather lax. Spikelets 2- to 3-flowered. Glumes nearly as long as the florets, abruptly acuminated, usually denticulate towards the apex, terminated by an awn about one-fourth their own length. Lower pale 5-ribbed, the midrib excurrent into a short awn, about one-fourth the length of the pale, lateral ribs or at least one pair of them also excurrent in the form of teeth or very short setæ.

On rocks, especially those of mica-slate, and limestone, and on banks. Local. It occurs in the counties of York, Durham, Northumberland, Westmoreland, and Cumberland, and again in the Scotch Highlands, in Perth, Stirling, and Ross. Local in Ireland, and confined to the western counties, from Lough Derg to Ballyshannon.

England, Scotland, Ireland. Perennial. Spring, Summer.

Plant growing in dense or more usually in loose tufts; in the former case, the branches of the rootstock are short, in the latter often several inches long, with numerous radical fibres, and thickly clothed with the decayed sheaths and bases of the leaves. Stem 2 to 18 inches long, very slender, leafy at the base, and with 1 or 2 very short leaves above the basal tuft, more or less decumbent, at least in fruit, when it is often prostrate-arching. Leaves variable in length and breadth even in the same plant, 2 inches to 1 foot long, $\frac{1}{8}$ to $\frac{1}{4}$ inch broad, more or less rough on the margins, with numerous strongly marked ribs, rough on the margins. Panicle $\frac{1}{4}$ to $1\frac{1}{4}$ inch long, more or less tinged with dark purplish lead-colour when in flower. Spikelets about $\frac{1}{5}$ inch long. Glumes somewhat silvery. Lower pale pubescent, terminated by an awn, and vesicles with either 2 or 4 teeth, which are sometimes lengthened into short bristles.

Blue Moor-Grass.

TRIBE VII.—AGROSTIDEÆ.

Spikelets open during flowering, arranged in a lax open panicle, or more rarely in a dense cylindrical spikelike panicle, laterally compressed, each containing a single perfect floret, sometimes with a superior rudimentary one, very rarely with 2 or more perfect florets. Glumes equal or unequal, at least one of them longer than the florets. Pales scarious, the lower one keeled. Stamens 3. Styles very short; stigmas 2, protruded at the base of the florets between the margins of the pales. Caryops subcylindrical or compressed, with a furrow line on the inner face, loosely covered by the pales.

GENUS XV.—**GASTRIDIUM.** *Pal. de Beauv.*

Spikelets shortly stalked, arranged in a narrow compact dense lobed panicle with short lateral branches which are spreading during flowering and afterwards adpressed, laterally compressed, open during flowering, each containing a single perfect floret without the rudiment of a second. Glumes 2, nearly equal, both much longer than the floret, bluntly keeled, acute but not awned, swollen and ultimately indurated at the base, subscarious. Pales 2, very unequal, hyaline, the lower one very shortly bearded at the base, truncate and denticulate at the apex, with or without a bent dorsal awn; upper pale very minute, with 2 keels. Lodicules 2, entire. Stamens 3. Styles 2, nearly sessile, plumose, protruded at the sides of the floret between the basal margins of the pales. Caryops glabrous, free, oval, slightly dorsally compressed, flat and with a shallow furrow on the inner face.

The name of this genus is derived from the Greek words *γαστήρ* and *ἴδιον*, in reference to a swelling on the glume.

SPECIES I.—**GASTRIDIUM LENDIGERUM.** *Gaud.*

PLATE MDCCXI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. LXXIII. Fig. 122.
Billot, Fl. Gall. et Germ. Exsicc. No. 1363.
G. australe, *Pal. de Beauv.* *Steudel*, Syn. Plant. Gram. p. 185.
Milium lendigerum, "*Linn.* Spec. Plant." *Sm.* Engl. Bot. ed. i. No. 1107.
Agrostis australis, *Linn.* (Mant.) *Hook. fil.* Stud. Fl. p. 432.
A. lendigera, *D.C.* Fl. Fr. Vol. III. p. 18.

Panicle open and rather lax during the time of flowering, closed before and after it. Glumes narrowly lanceolate, longly acuminate, shining, glabrous, scabrous on the keel. Lower pale hairy or pubescent, specially towards the margins in the apical half. Awn from about one-fourth below the apex of the pale, nearly as long as the glumes, or even exceeding them, sometimes absent.

In cornfields, dry pastures, roadsides, and waste places. Local. Confined to the south of England, reaching north to Glamorgan (or perhaps Flint), Warwick, and Norfolk.

England. Annual. Summer, Autumn.

Stems numerous, unequal, 3 to 18 inches high, geniculate below, then erect or ascending, simple, or sometimes branched from the lower knots, leafy. Leaves 1 to 3 inches long by $\frac{1}{8}$ to $\frac{1}{6}$ inch broad, pale green, with numerous slightly raised rough ribs and rough margins; sheaths smooth, the uppermost one slightly swollen, longer than its leaf; ligule lanceolate, longer than broad, laciniate. Panicle 1 to 4 inches long, close and lobed before and after flowering but with the branches spreading while the flowers are expanded, pale green and glistening until after flowering, afterwards dull straw-colour. Panicle branches in half whorls, short, some of them bearing spikelets down to the base, others bare for about half their length. Spikelets $\frac{1}{6}$ to $\frac{1}{5}$ inch long. Glumes with the swollen base polished and ultimately subcoriaceous. Pales scarcely extending beyond the swollen part of the glumes, almost always with a long twisted awn, which reaches the apex of the glumes or extends a little way beyond it. Anthers pale yellow.

Awned Nilgrass.

Sir J. E. Smith says of this, "An annual grass, growing (though rare) in such fields near the sea as are occasionally overflowed." It is, however, not confined to the coast, as it occurs in Surrey.

It is recorded by Mr. Edwin Lees as having been gathered in the Severn Valley (see "Botany of Worcester," p. 61). In this position it may be said to form a part of the sea-side flora which still lingers in the valley of the Severn, attesting its former marine condition, when in fact this line of country justified the name of the "Straits of Malvern," as given to it by Sir R. Murchison.

It is easily distinguished from any other British grass by the peculiar glossy tumid appearance at the base of the glumes. It is by no means a common grass, and is not known to be of any agricultural value.

GENUS XVI.—**LAGURUS.** *Linn.*

Spikelets subsessile, arranged in a very dense ovate-ovoid or subglobose spikelike panicle, laterally compressed, open during flowering, each containing a single perfect floret, with the stalklike rudiment of a second one above it. Glumes 2, equal, longer than the floret, bluntly keeled, gradually acuminated into a long terminal planelike awn, subscarious. Pales 2, very unequal, membranous, the lower one bearded at the base, terminating in 2 bristles at the apex, and with an extremely long bent dorsal awn; upper pale shorter than the lower, with 2 keels. Lodicules 2, entire or denticulate. Stamens 3. Stigmas 2, sessile, plumose, protruded at the sides of the floret between the basal margins of the pales. Caryops glabrous, free, elliptical-fusiform, slightly furrowed on the inner face.

The name of this genus is derived from the Greek words λαγώς, a hare, and **οὐρά, a tail—hare's tail.**

SPECIES I.—**LAGURUS OVATUS.** *Linn.*

PLATE MDCCXII.

Reich. **Ic. Fl. Germ. et Helv. Vol. I. Tab. XCI. Fig. 169.**
Billot, **Fl. Gall. et Germ. Exsicc. No. 182.**

The only known species.

Sandy places by the sea. Very local. Near the most northern martello tower, Vazon Bay, Guernsey; L'Ancresse Common in the same island (Mr. C. Bailey and Mrs. Russell); Sewer's End, near Saffron Walden, Essex, about 1842, but no doubt a casual introduction.

Channel Islands. Annual. Early Summer.

Plant growing in tufts. Stems slightly geniculate at the base, then erect or ascending, unequal, 2 to 18 inches high, usually branched from the lower nodes, leafy towards the base. Leaves in the Guernsey specimens $\frac{1}{2}$ to 2 inches long by $\frac{1}{4}$ to $\frac{3}{8}$ inch broad, densely clothed with white soft pubescence; upper sheaths swollen and all of them pubescent; ligule obtuse, about as long as broad, pubescent. Spike ovate-ovoid or subglobular-ovoid, $\frac{1}{2}$ to 2 inches long, nearly white. Spikelets $\frac{1}{4}$ to $\frac{3}{8}$ inch long. Glumes plumose almost to the apex. Lower pale with a bent dorsal awn a little below the summit, the awn extending beyond the glumes, and fully twice as long as the two lateral bristles which terminate the pale. Anthers yellowish-white.

Ovate Hare's-tail Grass.

The glumes of this grass are so densely clothed with long silky hairs, and the flowers being gathered into a compact oval head, give it much of the softness and appearance of the caudal appendage of the creature after which it is named.

It is a beautifully ornamental grass, and on this account is grown in our gardens, and dried specimens are constantly used as ornaments to the drawing-room.

It bears cultivation remarkably well, improving in size and silky softness under the process, but in as far as we know, its occurrence in Guernsey is our only warrant for its admission as a British native.

GENUS XVII.—POLYPOGON. *Desf.*

Spikelets shortly stalked, arranged in a narrow compact cylindrical or lobed often spikelike panicle with short lateral branches which are spreading only during the time of flowering, laterally compressed, open during flowering, each containing a single perfect floret without the rudiment of a second. Glumes 2, nearly equal, longer than the floret, bluntly keeled, notched at the apex, with a long awn proceeding from the bottom of the notch, scarious. Pales 2, unequal, membranous, the lower one not bearded at the base, entire or denticulate, with a short awn from the back immediately below the apex, or awnless; upper pale smaller, with 2 keels. Lodicules 2, glabrous. Stamens 3. Stigmas 2, subsessile, plumose, protruded at the sides of the florets between the basal margins of the pales. Caryops glabrous, free, ovoid, not compressed, with a shallow furrow on the inner face.

The derivation of the name of this genus appears to be from πολύς, much, and πώγων, a beard, from the long awns of the florets.

SPECIES I.—POLYPOGON MONSPELIENSIS. *Desf.*

PLATE MDCCXIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. XCI. Fig. 170.
Billot, Fl. Gall. et Germ. Exsicc. No. 1359.
Agrostis panicea, *Ait.* *Sm.* Engl. Bot. ed. i. No. 1704.
Alopecurus Monspeliensis, *Linn.* Spec. Plant. p. 89.
A. paniceus, *Lam.* Fl. Fr. Vol. III. p. 560.
Phleum crinitum, *Schreb.* *Sm.* Fl. Brit. Vol. I. p. 71.

Annual. Panicle very dense, oblong, with approximate spreading branches when in flower, but closed, cylindrical, slightly lobed, and spikelike before and after flowering. Pedicels articulated above the base, the upper portion thickened, as long as broad (the breadth being measured at the apex), much shorter than the lower portion. Glumes obtuse, notched at the apex, where there are 2 subobtuse lobes about as long as broad and about one-eighth the length of the rest of the glume, finely scabrous-pubescent, ciliated with thick cartilaginous hairs on the keel and slender ones on the margins and apical lobes, with a scabrous dorsal awn springing from the bottom of the apical notch, and from two and a half to three times as long as the glumes. Lower pale truncate and denticulate at the apex, with a terminal scabrous awn from one-fourth to three-fourths the length of the pale, or without any awn.

In marshes and waste places near the sea and tidal rivers. Very local. Near Porchester, and at several places in Portsea Island, Hants; Plumstead Practice Ground, immediately to the south of the butts, and near Erith, Kent; near the "World's End," Canvey Island, Essex, and found by Ray in the same county near Purfleet and a mile and a half above Tilbury Fort; Cley and Brancaster, Norfolk; near St. Sampson's, Guernsey. It has occurred as a casual by the Berkley Canal, Gloucester; and on the ballast heaps about Sunderland, Durham; and St. David's, Fife.

England. Annual. Summer, Autumn.

Plant growing in tufts with numerous stems, which are frequently somewhat decumbent and geniculate and occasionally branched at the base in luxuriant examples, from 3 inches to 4 feet high. Leaves 1 to 6 inches long by $\frac{1}{8}$ to $\frac{3}{4}$ inch broad, with numerous slender very scabrous unequal ribs, pale green; sheaths smooth, the uppermost one swollen; ligule long, laciniate. Spike $\frac{1}{2}$ to 6 inches long, more distinctly lobed in the larger examples than in the smaller. Spikelets, exclusive of the awns, $\frac{1}{10}$ inch long. Glumes membranous, whitish, with a green stripe from the base of the awn halfway to the base on each side of the keel. Awns white, giving a silky appearance to the panicle, especially in the larger examples. M. Godron, in the "Fl. de France," and Professor Parlatore, in "Fl. Italiana," describe the glumes as entire; they are not so in the dried British, nor in any foreign specimens that I have examined, but I have not had fresh examples to see if the glumes were entire in such. The apical lobes of the glumes, however, are much shorter and blunter than in P. maritimus (*Willd*), which is a subspecies of P. Monspeliensis, which has not been detected in Britain.

In P. Monspeliensis the lower pales are half as long as the glumes, and the outer pales may be found with and without awns, and with awns of different lengths even in the same panicle; but most of the pales have either a short or comparatively long awn, while in P. maritimus the awn seems to be always wanting.

Annual Beard Grass.

German, *Sandhalm Ostsee.*

SPECIES II.—POLYPOGON LITTORALIS. *Sm.*

PLATE MDCCXIV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. XCII. Fig. 172.
Billot, Fl. Gall. et Germ. Exsicc. No. 2169.
P. Lagascæ, *Röm. & Schultes*, Syst. Veg. Vol. II. p. 326.
Agrostis littoralis, *Sm.* Eng. Bot. ed. i. No. 1251.
A. lutosa, *Poir.* Dict. Suppl. Vol. I. p. 249.

Perennial. Rootstock creeping, producing tufts of stems and barren shoots. Panicle rather dense, with separated spreading branches when in flower, but closed, oblong-fusiform, much lobed, and scarcely spikelike before and after flowering. Pedicels articulated at the base, thickened upwards, longer than broad. Glumes acuminate, acute, indistinctly notched at the apex, with very minute acute lobes, finely scabrous-pubescent, ciliated with thick cartilaginous hairs on the keel and slender ones on the margins and apex, with a scabrous dorsal awn springing immediately below the apex, from one-half to three-fourths as long as the glumes. Lower pale acuminate and bidentate at the apex, with a very slightly scabrous awn from the bottom of the notch, varying from as long as to two and a half times as long as the pale.

In marshes near the sea and tidal rivers. Very local, usually growing with P. Monspeliensis. Near Porchester and Portsea, Hants; Plumstead Practice Ground, and near Erith, Kent; Essex coast (?), said to have been found by Dickson, but not confirmed by recent observers; Cley and near Wells, Norfolk; St. Sampson's, Guernsey.

England. Perennial. Summer.

Stems 9 inches to 3 feet high. Longest leaves 2 to 6 inches long by $\frac{1}{8}$ to $\frac{5}{8}$ inch broad, duller green and more stiff than in P. Monspeliensis, in other respects similar; upper sheath scarcely swollen; ligule long, laciniate. Panicle 1 to $7\frac{1}{2}$ inches long, usually tinged with purple, but sometimes green, bearing considerable resemblance to that of Agrostis alba. Spikelets $\frac{1}{10}$ to $\frac{1}{8}$ inch long, exclusive of the awns. Awns considerably shorter than those of P. Monspeliensis. Lower pale longer and narrower, and more pointed than that of P. Monspeliensis, with a much longer and smoother awn.

Perennial Beard Grass.

Both species are very free seeding grasses, and their seeds grow readily in cultivation in any part of England, so that were these grasses part of our aboriginal Flora, they would have had a wider range, and have occurred less sparingly. They are handsome grasses, against which no particular war should be waged by the farmer or gardener.

GENUS XVIII.—**AGROSTIS.** *Linn.*

Spikelets stalked, arranged in a loose or rarely dense open panicle with elongate branches which are spreading at least during the time of flowering, slightly laterally compressed, open during flowering, each containing a single perfect floret without the rudiment of a second floret, or with a stalklike superior rudiment. Glumes 2, slightly unequal, the upper one or both longer than the floret, keeled, acute but not awned, scarious. Pales 2, unequal, hyaline, the lower one very slightly bearded at the base, keeled, truncate and denticulate at the apex (rarely acute and entire), with or without a bent dorsal awn; the upper one smaller, with 2 keels, or sometimes very minute or absent. Lodicules 2, entire. Stamens 3, more rarely 1. Stigmas 2, subsessile, plumose, protruded at the sides of the florets between the basal margins of the pales. Caryops glabrous, free, elliptical-ovoid, not compressed, with a shallow furrow on the inner face.

The name of this genus is derived from the Greek ἄγρωστις, the name of some grass, perhaps from ἀγρός, a field.

SECTION I.—APERA. *Pal. de Beauv.*

Lower glume smaller than the upper one. Lower pale entire, with an awn a little below the apex more than thrice as long as the pale; upper pale little shorter than the lower one.

SPECIES I.—**AGROSTIS ANEMAGROSTIS.**

PLATES MDCCXV. MDCCXVI.

Annual. Without radical leaves. Panicle lax, open during and after flowering or always closed. Lower glume shorter and narrower than the upper one. Lower pale longer than the lower glume, acute. Awn dorsal, slender, slightly bent, from immediately below the apex of the pale, three to four times the length of the pale. Upper pale but little shorter than the lower.

SUB-SPECIES I.—**Agrostis Spica-venti.** *Linn.*

PLATE MDCCXV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. LXXIII. Fig. 125.
Billot, Fl. Gall. et Germ. Exsicc. No. 1362.
Apera Spica-venti, *Pal. de Beauv.* *Bab.* Man. Brit. Bot. ed. iv. p. 406. *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 904. *Reich.* Ic. l. c. p. 8.
Anemagrostis Spica-venti. *Trin.* Fund. Agr. p. 129.

Panicle closed and continuous before flowering, but lax, open, and usually drooping at the apex in flower and after flowering. Longest panicle-branches exceeding the internode between them and the next whorl; nearly all of them bare of spikelets at the base. Anthers linear-oblong.

In sandy cultivated fields. Rather local, extending from North Hants, Sussex, and Kent to Durham and Northumberland.

England. Annual. Summer, Autumn.

Stems several, 8 inches to 3 feet high, erect, straight, or slightly geniculate at the base, simple or branched from the lower nodes. Longest leaves 2 to 5 inches long by $\frac{1}{8}$ to $\frac{1}{4}$ inch broad, with numerous slender rough ribs, pale dull green; sheaths slightly rough, the uppermost one not inflated, longer than its leaf; ligule long, laciniate. Panicle 2 to 10 inches long by 1 to 5 inches broad when expanded, green or more or less tinged with purplish-brown, ultimately pale olive. Panicle-branches capillary, scabrous, the longer ones bare of florets for half their length. Spikelets $\frac{1}{12}$ inch long, exclusive of the awns. Glumes scabrous on the back. Awns very long and slender.

I have retained the name A. Spica-venti for this subspecies, because it has been known by this name as distinct from A. interrupta from the time of Linnæus; and under these circumstances it seems the least of two evils to give an entirely new name to the superspecies.

Apera purpurea of Palisot de Beauvais, a South European variety of A. Spica-venti, with short but spreading branches, is the connecting link between A. Spica-venti and A. interrupta.

Spreading Silky Bent-Grass.

French, *Agrostide jouet du vent.* German, *Gemeiner Windhalm.*

This is one of the handsomest of our British species of grasses, and is found in agrarian fields on sandy soils.

SUB-SPECIES II.—**Agrostis interrupta.** *Linn.*

PLATE MDCCXVI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. LXXXIII. Fig. 123.
Apera interrupta, *Pal. de Beauv.* *Bab.* Man. Brit. Bot. ed. vi. p. 406. *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 904. *Reich.* Ic. l. c. p. 7.
Anemagrostis interrupta, *Trin.* Fund. Agr. p. 18.

Panicle closed before, during, and after flowering. Longest panicle-branches usually shorter than the internode between them and the next whorl; the shorter ones bearing spikelets to the base. Anthers quadrate-oval.

In sandy fields. Very local. Pampisford and Chippenham, Cambridge; Redneck Heath and other places about Thetford, Suffolk, and Norfolk, said to have been found by Mr. Varenne, near Mark's Tey Station, Essex, in 1843, but according to the "Flora of Essex" not observed there in 1860.

England. Annual. Summer, Autumn.

Stems 2 inches to 2 feet high. Leaves shorter and considerably narrower than those of A. Spica-venti. Panicle 2 to 7 inches long, appearing interrupted, from the branches being shorter or mostly shorter than the internodes, and always adpressed. This and the shorter anthers seem the only tangible distinctions between A. interrupta and A. Spica-venti. The spikelets of the two are undistinguishable, except that those of A. interrupta appear to be always green, never tinged with purple.

Dense-flowered Silky Bent-Grass.

German, *Unterbrochener Windhalm.*

This species is found in the same fields with the former one. It is of no agricultural value, but its presence indicates light land.

SECTION II.—TRICHODIUM. *Mich.*

Lower glume larger than the upper one. Lower pale truncate and denticulate at the apex. Awn from about or below the middle or near the base of the pale, not extending beyond the pale more than the length of the latter. Upper pale absent or very minute.

SPECIES II.—**AGROSTIS SETACEA.** *Curt.*

PLATE MDCCXVII.

Billot, Fl. Gall. et Germ. Exsicc. No. 1977.
Trichodium setaceum, *Röm. & Schultes*, Syst. Veg. Vol. II. p. 280.
Vilfa setacea, *Pal. de Beauv.* Agrost. p. 16.

Densely cæspitose, without stolons. Stems erect or ascending, not rooting at the base. Radical leaves numerous, in compact erect fascicles, setaceous, involute, glaucous. Stem leaves few, short, a little broader than the radical leaves, involute; sheaths nearly smooth, the uppermost one many times longer than its leaf; ligule oblong, prominent, laciniate. Panicle narrowly cylindrical, rather dense, closed except at the moment of flowering; panicle-branches short, but little exceeding the internodes of the rachis, rough, only the longer ones bare of florets towards the base for about half their length. Glumes narrowly lanceolate, acuminate, lower one a little longer and broader than the other, scabrous on the keel nearly throughout. Lower pale about two-thirds the length of the lower glume, broadly truncate, with 2 short setæ at the apex. Awn from between the base and the middle of the pale, bent, extending about the length of the pale beyond its apex. Upper pale not one-fourth as long as the lower one.

On dry heaths, commons, and downs. Local. Confined to the south of England. Found in Cornwall, Devon, Somerset, Hants, Sussex, Surrey, and Glamorgan.

England. Perennial. Summer.

Plant growing in dense tufts. Radical leaves very numerous, 2 to 9 inches long, very slender, always much shorter than the stem. Stem 6 inches to 2 feet high, smooth. Uppermost stem leaf ½ to 1 inch long. Panicle 1 to 4 inches long, even in the latter case with the branches not more than an inch long. Spikelets ⅙ to ⅕ inch long. Glumes green, tinged with purple, especially towards the margins and apex, ultimately straw-colour. Anthers oblong, purple.

According to Dr. Bromfield the panicle is but little expanded at any time, spreading a little only in fine weather and at certain times of the day, and collapsing even then when gathered.

The awn is usually described as springing from the base of the pale, but in the specimens from the Isle of Wight, Devon, and Cornwall which I have examined, it arises from a point a little below halfway between the middle and the base of the pale.

Bristle-leaved Bent Grass.

SPECIES III.—AGROSTIS CANINA. *Linn.*

PLATE MDCCXVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. LXXIV. Figs. 128 and 129.
Billot, Fl. Gall. et Germ. Exsicc. No. 3486.
Trichodium caninum, *Schrad. Röm. & Schultes,* Syst. Veg. Vol. II. p. 277.
Agraulus caninus, *Pal. de Beauv.* Agrost. p. 5.

Loosely cæspitose, with or without stolons. Stems erect or ascending, usually geniculate and sometimes rooting at the base. Radical leaves few, in loose trailing fascicles, setaceous, involute, green (in the British plant). Stem leaves several, moderately long, linear, flat; sheaths quite smooth, the uppermost one not above twice as long as its leaf; ligule oblong-lanceolate, long, scarcely laciniate. Panicle oval-oblong, lax, open during flowering, and irregularly closed afterwards; panicle-branches long, longer than the internodes of the rachis, slightly rough, all of them bare of florets towards the base for about half their length. Glumes broadly lanceolate, acuminate, lower one a little longer and broader than the other, scabrous on the keel throughout. Lower pale three-fourths the length of the lower glume, narrowly truncate, and with 2 minute teeth at the apex. Awn from about the middle of the pale, bent, extending about two-thirds of the length of the pale beyond its apex. Upper pale absent.

On wet heaths, pastures, and in damp woods. Common, and generally distributed.

England, Scotland, Ireland. Perennial. Summer, Autumn.

Plant growing in loose tufts, with elongate barren shoots. Radical leaves slender, but much less so than those of A. setacea, green somewhat channelled, 1 to 4 inches long. Stem leaves 3 or 4, the uppermost one 1 to 3 inches long, by $\frac{1}{10}$ to $\frac{1}{8}$ inch broad; sheaths quite smooth, the uppermost one less than twice as long as its leaf; ligule long, laciniate at the apex only. Panicle 1 to 5 inches long; panicle-branches very slender, the longest 1 to $2\frac{1}{2}$ inches long. Spikelets $\frac{1}{10}$ inch long, exclusive of the awns. Glumes brownish-purple with a green midrib, rarely wholly pale green. Anthers oblong, purple, broader in proportion than those of A. setacea. Lower pale longer in proportion to the glumes, and with a much narrower truncate apex than that of A. setacea, and differing also in having the 2 excurrent ribs forming only small teeth, not short setæ.

The very lax panicle and the root leaves not being densely tufted distinguish A. canina from A. setacea at first sight.

Brown Bent Grass.

French, *Agrostide des chiens.* German, *Hunds-Straussgras.*

SECTION III.—EU-AGROSTIS. *Godr.*

Lower glume a little larger than the upper one. Lower pale truncate and denticulate at the apex. Awn absent or from below the middle of the pale. Upper pale conspicuous, at least half as long as the outer.

SPECIES IV.—**AGROSTIS ALBA.** *Linn.*

PLATES MDCCXIX. MDCCXX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tabs. LXXV. and LXXVI. Figs. 133 to 136.
A. stolonifera, *Fries*, Summ. Veg. Scand. p. 79. *Reich.* Ic. l.c. p. 9. *Linn.* ex parte.

Not cæspitose, often with elongate creeping or floating stolons. Stems erect or ascending from a decumbent and usually rooting base. Leaves all flat; sheaths nearly smooth, the upper one not more than twice as long as its leaf; ligule oblong-lanceolate, long, scarcely laciniate. Panicle lanceolate-oblong, lax, rarely dense, open during flowering, and irregularly closed afterwards; panicle-branches rather long, generally longer than the internodes of the rachis, rough, the longer ones bare of florets at the base for less than half their length, the shorter sometimes with florets nearly or quite to the base. Glumes broadly lanceolate, acuminate, the lower one a very little larger than the upper, scabrous on the back from near the base to the apex. Lower pale three-fourths the length of the lower glume, narrowly truncate, and with 2 minute teeth at the apex. Awn usually absent, when present from below the middle of the pale, and extending about two-thirds of the length of the pale beyond its apex. Upper pale about three-fourths the length of the lower one.

Var. α, *genuina*.

PLATE MDCCXIX.

Billot, Fl. Gall. et Germ. Exsicc. No. 1361.
A. alba, *Sm.* Engl. Bot. No. 1189.

Stem rooting only at the base. Panicle lax, branches mostly bare of florets at the base.

Var. β, *stolonifera*. Sm.

PLATE MDCCXX.

Billot, Fl. Gall. et Germ. Exsicc. No. 3938.
A. stolonifera, *Sm.* Eng. Bot. ed. i. No. 1532. *Linn.* (?) ex parte.
A. alba, var. β, subrepens, *Bab.* Man. Brit. Bot. ed. vi. p. 407.

Stem rooting extensively at the lower joints. Panicle dense, somewhat spikelike and lobed before and after flowering, with the branches much more numerous at each node of the rachis than in var. α, and most of the shorter ones furnished with spikelets down to the base.

In marshes, meadows, damp woods, and pastures, and frequently floating in shallow water. Very common, and generally distributed. Var. β, on sands and clayey banks, chiefly by the sea and tidal rivers from Devon and the Isle of Wight north to Liverpool, and perhaps Orkney.

England, Scotland, Ireland. Perennial. Summer, Autumn.

A very variable plant, scarcely tufted, and with elongate barren shoots which sometimes, when floating in water, attain a great length and bear a considerable resemblance to those of Alopecurus fulvus and A. geniculatus. Flowering stems 1 to 3 feet high. Leaves all similar, the longest ones 3 inches to 1 foot long by $\frac{1}{8}$ to $\frac{1}{2}$ inch broad. Panicle 2 to 9 inches long, usually very lax, but in var. β dense. Spikelets $\frac{1}{10}$ to $\frac{1}{8}$ inch long. Glumes usually green, but sometimes brownish-purple. Rarely the panicle is viviparous.

I have not myself met with the awned form of A. alba, but even in this state it may be known from A. canina by having the upper pale developed.

Marsh Bent Grass.

French, *Agrostide blanche.* German, *Weissliches Straussgras.*

This species and its varieties, though amongst some of our more elegant grass forms, will ever afford species-splitting puzzles to those who delight in that kind of employment.

Professor Buckman writes: "Our own experiments have convinced us that several acknowledged varieties can be grown from the seed of a single plant, and we have no doubt but that additional permanent forms may be easily obtained.

"The presence or absence of the awn, or its relative length, is by no means certain; so the foliage is longer or smaller, and the stolons longer or shorter, according to circumstances; but a plant which will grow in a wet ditch, on the tops of the stony Cotswolds, or mat together the sands of Dorset and other districts, may be expected to be as variable in its size and appearance as it is catholic in its tastes. The true A. alba has been recommended for cultivation in irrigated meadows, and its yield in some of these on the Thames tributaries is remarkable."

"At the same time," says Sinclair, "it is a poor grass, and stock will not eat much of it, if other kinds are plentiful."

It may be well to remark that in a field once under the plough, near Cirencester, but afterwards made part of an irrigated meadow, the Agrostis assumed the same form as in the neighbouring irrigated fields, thus changing from A. alba to A. alba var. stolonifera under irrigation; and we have no doubt the true A. alba of the wet meadow would change in the arable to the congested form. The A. alba var. stolonifera is nevertheless an established agrarian weed; and when we say that over a great part of England this plant costs the farmer from 1s. to 20s. an acre to keep it in check, some notion may be formed of its hindrance to farming, when it is allowed by an outgoing tenant to make head, as the loss indicated does not represent the failure in crops from its occupying the place of the crop plant itself.

Consequent on the neglect of this pest, Professor Buckman calculates that for the last seven years it has cost him a rent-charge of fourteen per cent.

This shows how important it is to keep land free from this and every other kind of couch grass, for, as it must be removed if good crops are to be obtained, it will be found that a great part of the expense of labour and machinery on a farm is after all connected more or less therewith, and of all couchlike grasses the A. stolonifera or Fiorin is the most troublesome. The collected rhizomes of this and Triticum have been recommended to be washed and used as food for horses, but experience shows that it contains a bitter extractive matter not at all relished by cattle.

Burnt, and the ashes applied as manure, it will be found to be fertilising—a fact which should convince the farmer that it must live upon fertilising matter, and its removal must therefore impoverish the soil.

SPECIES V.—AGROSTIS VULGARIS. *With.*

PLATE MDCCXXI.

Billot, Fl. Gall. et Germ. Exsicc. No. 3485.

Subcæspitose, with or without stolons. Stems erect or ascending, rarely rooting at the base. Leaves all flat; sheaths quite smooth, the uppermost one not more than twice as long as its leaf; ligule quadrate, entire. Panicle oblong-conical, lax, open during and after flowering; panicle-branches rather long, generally longer than the internodes of the rachis, slightly rough, all bare of florets at the base for about half their length. Glumes broadly elliptical-lanceolate, acuminate, the lower one a very little longer than the upper, scabrous on the back from the middle to the apex. Outer pale about two-thirds the length of the lower glume, narrowly truncate, and with 2 minute teeth at the apex. Awn usually absent; when present, from below the middle of the pale and extending about two-thirds the length of the pale beyond its apex. Upper pale about two-thirds the length of the lower one.

Var. α, *genuina.*

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. LXXV. Fig. 13.

Stems tall, at least five or six times as long as the panicle.

Var. β, *pumila.*

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. LXXV. Fig. 132.
A. pumila, *Linn.* Mant. I. p. 31. *D.C.* Fl. Fr. Vol. III. p. 22.

Stems very short, as long as to thrice as long as the panicle. Leaves narrower; spikelets smaller; and glumes broader than in var. α.

On dry heaths and pastures, and by roadsides. Common and universally distributed. Var. β chiefly in hilly districts, and dry sandy places, from Somerset and Kent north to Skye and Aberdeen, and probably extending still farther north.

England, Scotland, Ireland. Perennial. Summer, Autumn.

Very similar to A. alba, with which it is often confounded, but it may be readily distinguished by its panicle being open not only during flowering, but afterwards, and by the trichotomous divisions of the panicle-branches being more divaricate. The spikelets are smaller, about $\frac{1}{12}$ inch long, the glumes commonly purplish-brown, rarely pale green. The lower pale is shorter in proportion to the lower glume, and the upper pale shorter in proportion to the lower pale. The plant usually grows in denser tufts, and the stolons when present are shorter and less straggling, never floating. The leaf-sheaths are perfectly smooth, and do not present the slight roughness which those of A. alba do when the fingers are passed over them downwards. The ligule is only about half the length and much blunter, the stems are rarely above a foot high, and I have never seen them more than 18 inches. The panicle in var. α is from 1 to 4 inches long by $\frac{3}{4}$ to $2\frac{1}{2}$ inches broad. The uppermost stem leaf is from 2 to 3 inches long.

In var. β the stem is from 1 to 4 inches high. Panicle $\frac{1}{2}$ to $1\frac{1}{2}$ inch long by $\frac{1}{4}$ to $\frac{3}{4}$ inch broad. The spikelets are sometimes not more than $\frac{1}{16}$ inch long, always brown, the uppermost leaf $\frac{1}{3}$ to 1 inch long, usually close to the panicle. The ovaries in this variety appear to be usually, if not always, attacked by the fungus Ustilago.

Common Bent Grass.

French, *Agrostide commune.* German, *Gemeines Straussgras.*

This grass is said to be disliked by cattle generally, and is not of sufficient importance to merit the attention of agriculturists. It grows on dry heaths and pastures, sometimes at an elevation of nearly 2,000 feet above the sea.

GENUS XIX.—**PSAMMA.** *Pal. de Beauv.*

Spikelets shortly stalked, arranged in a very dense fusiform-cylindrical or slightly lobed spikelike panicle which has short adpressed lateral branches, laterally compressed, biconvex, open during flowering, each containing a single perfect floret, with the superior stalklike rudiment of a second. Glumes 2, nearly equal, a little longer than the floret, keeled, acute, but not awned, parchmentlike. Pales 2, nearly equal, parchmentlike, the lower one shortly bearded at the base, keeled, 5-ribbed, bidentate and mucronate at the apex, very shortly awned; the upper one with 2 keels. Lodicules 2, lanceolate. Stamens 3. Stigmas 2, sessile, plumose, protruded at the sides of the florets between the basal margins of the pales. Caryops glabrous, free, oblong, deeply furrowed on the inner face.

The derivation of the name of this genus of grasses is from the Greek word ψάμμη, sand, in allusion to the locality in which the species delights.

SPECIES I.—**PSAMMA ARENARIA.** *Röm. & Schultes.*

Plate MDCCXXII.

Reich. Ic. Fl. Gall. et Germ. Exsicc. Vol. I. Tab. LXXXV. Fig. 157.
Billot, Fl. Gall. et Germ. Exsicc. No. 1779.
Ps. littoralis, *Pal. de Beauv.* Agrost. p. 145.
Ammophila arundinacea, *Host*; *Parl.* Fl. Ital. Vol. I. p. 214. *Kunth*, Enum. Pl. Vol. I. p. 245.
A. arenaria, *Link*, Hort. Ber. Vol. I. p. 105.
Calamagrostis arenaria, *Roth*; *Fries*, Summ. Veg. Scand. p. 79. *D. C.* Fl. Fr. Vol. III. p. 24.
Arundo arenaria, *Linn.* *Sm.* Engl. Bot. ed. i. No. 520, and Engl. Fl. Vol. I. p. 171.

Rootstock very extensively creeping. Panicle spikelike, fusiform-cylindrical, narrowed towards the base, very dense, not lobed (or rarely slightly lobed), continuous, greenish-white. Glumes acute. Hairs at the base of the floret, about one-third the length of the glumes. Outer pale 5-ribbed.

On loose sand by the sea. Rather common, and generally distributed on the coast.

England, Scotland, Ireland. Perennial. Late Summer.

Rootstock very widely creeping. Stem 2 to 3 feet high, usually filled with pith. Leaves about as long as the stem, rigid, channelled or involute, with numerous thick close cartilaginous minutely pubescent glaucous ribs above; leaves of luxuriant barren shoots, sometimes nearly flat, and then about $\frac{1}{4}$ inch broad, but the involute leaves not above half that width; sheaths smooth; ligule very long, laciniate. Panicle 3 to 6 inches long by about $\frac{3}{4}$ inch wide, attenuated at the base and apex, very dense. Glumes $\frac{1}{2}$ inch long, rough on the keel in the upper half. Pales about $\frac{1}{12}$ inch shorter than the glumes, the lower one of the same parchmentlike texture as the glumes, and with a very short awn from a little below the apex, and not extending greatly beyond it, often not at all. Hairs at the base of the pales less than half their length. Inner pale nearly as long as the outer, but of a thinner texture.

Leaves resembling those of Triticum junceum, but longer, more erect and more rigid, all of them becoming almost convolute when dry.

Murram.

German, *Gemeiner Sandhalm.*

This grass is known as Mat Grass, or Murram. Dr. Prior says the latter name is derived from the Gaelic *murum*, or the Danish *marhalm*, sea haulm or straw. Its value as a natural sand-binder cannot be overrated; many thousand acres, on various parts of our coast, are preserved from being overwhelmed by the drifting sand by means of its agency. In the latter part of the last century a large district on the eastern side of Scotland, near the Moray Firth, was completely destroyed and rendered in a few years as desert as the Sahara by the advance of the sand from the shore, owing to the wanton destruction of the Murram that grew upon it. This grass, therefore, when found growing on sandy shores, should always be carefully preserved by proprietors of land. Acts of Parliament have been passed to protect it, which are but little attended to; and in Holland it is said that its destruction is a penal offence. The strong underground stems, which render it so valuable as a protection against the action of the wind and waves, are capable of being made into ropes; and people near the coast often plait them into mats, whence one of the common names of the grass. Professor Buckman says: "We have exhumed rhizomata of this grass several feet in length, and as these mat and weave together, in the positions indicated, they act as powerful conservators of the coast line, and we cannot help thinking that the Psamma might be cultivated with advantage with the view of keeping together some of our slippery railway embankments. To this it may be objected that it is a maritime species; but inasmuch as we have grown it on the sandy clays of the Forest Marble, far remote from the seaside, we have no fear of its success on this account."

GENUS XX.—CALAMAGROSTIS. *Adans.*

Spikelets stalked, arranged in a loose or rarely dense open panicle which has elongate spreading branches at least during the time of flowering, laterally compressed, biconvex, open during flowering, each containing a single perfect floret, without the rudiment of another, or with a stalklike superior rudiment. Glumes 2, nearly equal, or the lower one a little longer than the upper, much longer than the florets, parchmentlike or membranous, keeled, very acute or mucronate, but not awned. Pales 2, unequal, the lower one conspicuously bearded at the base, keeled, truncate or denticulate at the apex, with a straight or bent dorsal or subapical awn; upper pale smaller, with 2 small keels on the back. Lodicules 2, lanceolate. Stamens 3. Stigmas subsessile, plumose, protruded at the sides of the florets between the basal margins of the pales. Caryops glabrous, free, narrowly oblong and slightly dorsally compressed.

The name of this genus of grasses is derived from κάλαμος, a reed, and ἄγρωστις, a grass.

SPECIES I.—CALAMAGROSTIS EPIGEIOS. *Roth.*

PLATE MDCCXXIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. LXXXIV. Fig. 154.
Billot, Fl. Gall. et Germ. Exsicc. No. 687.
Arundo Epigeios, *Linn.* *Sm.* Engl. Bot. ed. i. No. 403; and Engl. Fl. Vol. I. p. 169.

Leaves broadly linear, firm, with numerous raised cartilaginous nearly equal rough ribs and very scabrous margins, dull green, slightly glaucous; sheaths slightly rough, the upper one longer than its leaf; ligule very long, lanceolate, laciniate. Panicle erect, oblong-lanceolate, or lanceolate-cylindrical, rather dense, closed and lobed, except at the moment of flowering, when it opens slightly; panicle-branches very rough. Spikelets crowded and subunilateral on the ultimate branches of the panicles. Glumes lanceolate-subulate, very scabrous on the keel, parchmentlike. Lower pale about half the length of the glumes, deeply bifid, with 2 long very acute lobes. Awn from about the middle of the back of the pale, straight or slightly curved, but not geniculate, rough, a little longer than the pale, but shorter than the glumes. Hairs at the base of the floret about as long as the glumes and longer than the awn. Rudimentary floret absent.

In bushy places, thickets, and open places in woods, on clay or damp sand. Local, but widely distributed, extending from Devon, the Isle of Wight, and Kent, to the Isle of Mull and the banks of the Dee in Aberdeenshire. Very rare in Ireland, where it is not now known to occur, except in the county of Derry, and in the great Island of Arran, Galway; it has been reported from County Cork.

England, Scotland, Ireland. Perennial. Late Summer, Autumn.

Rootstock creeping, with long scaly stolons. Stems 2 to 6 feet high, stout, rough, erect. Leaves of the barren radical tuft 1 to 2 feet long, the lower stem leaves considerably longer, the uppermost one 6 inches to 1 foot or more long, $\frac{5}{8}$ to $\frac{3}{4}$ inch broad, flat, but becoming involute when the plant is gathered or late in the season, when they begin to wither. Panicle 6 inches to 1 foot long, 1 to 2 inches broad; panicle-branches very numerous at each node, forming half-whorls, the longest from 2 to 3 inches, unbranched and bare of spikelets for about half their length at the base, the shorter ones branched to about $\frac{1}{8}$ inch from the base. Spikelets nearly $\frac{1}{4}$ inch long, usually dull purple or purplish-brown, but sometimes wholly pale green. Hairs white, ultimately about as long as the glumes.

Wood Small Reed.

French, *Arundo épigeios.* German, *Land-Schilf.*

This is one of our handsomest grasses, and would seem to be more common than is generally supposed. We have found it in quantity in the woods at Oakley Park, Cirencester. It is also frequent in the woods of Dorset. Its silky hairs give the flowers a pleasing aspect to the collectors of grass bouquets.

SPECIES II.—CALAMAGROSTIS LANCEOLATA. *Roth.*

PLATE MDCCXXIV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. LXXXII. Fig. 151.
Billot, Fl. Gall. et Germ. Exsicc. No. 418.
Arundo Calamagrostis, *Linn.* *Sm.* Engl. Bot. ed. i. No. 2159; and Engl. Fl. Vol. I. p. 170.

Leaves linear, flaccid, with numerous slender unequal puberulent ribs (at least in the uppermost leaves) and finely scabrous margins, pale green; sheaths smooth, the uppermost one about as long as its leaf; ligule rather short, oblong, laciniate. Panicle drooping at the apex, broadly oblong-lanceolate, rather lax, loosely and irregularly closed before and after flowering, at which time it is widely opened; panicle-branches slightly rough. Spikelets laxly placed all round the ultimate branches of the panicle. Glumes lanceolate-subulate, slightly rough on the keel in the upper half, membranous. Lower pale a little more than half the length of the glumes, shortly 2-toothed, with the teeth small and mucronate. Awn from the bottom of the notch between the teeth, and consequently very near the apex of the pale, straight, very slightly exceeding the teeth of the pale. Hairs at the base of the floret, numerous, about one-fourth shorter than the glumes, but considerably longer than the awn. Rudimentary floret absent.

In swampy woods and wet meadows. Local, but widely distributed in England, extending from Devon, Isle of Wight, and Kent to Lancashire and Northumberland, said to occur near Pennicuik, Edinburgh, planted (?).

England. Perennial. Late Summer, Autumn.

Rootstock creeping, with long stolons. Stem 2 to 4 feet high, much more slender and smooth than that of C. Epigeios. Leaves $\frac{1}{8}$ to $\frac{1}{4}$ inch broad, much less rigid, and with the ribs little elevated, and every third or fourth rib stronger than the others. Panicle 3 to 9 inches long. Branches more slender, smaller, and fewer at each node than in the panicle of C. Epigeios. Glumes $\frac{3}{16}$ inch long, brownish-purple, rarely green. Inner pale not at all bifid, and with the extremely short awn springing from near the apex of the pale instead of from the middle, as in C. Epigeios.

The earlier British botanists, such as Hudson and Withering, transposed the names of this and the last species, from a Linnean error in quoting the synonyms.

Purple-flowered Small Reed.

French, *Calamgrostis lancéolé.* German, *Lanzettliches Schilf.*

SPECIES III.—CALAMAGROSTIS STRICTA. *Nutt.*

PLATES MDCCXXV. MDCCXXVI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. LXXVIII. Fig. 142.
Billot, Fl. Gall. et Germ. Exsicc. No. 3936.
C. neglecta, Fl. Wett. *Fries*, Summ. Veg. Scand. p. 79.
Arundo stricta, *Schrad.* *Sm.* Engl. Bot. ed. i. No. 2160; and Engl. Fl. Vol. I. p. 171.
A. neglecta, *Ehrh.* Beitr. Vol. VI. p. 137.
Deyeuxia neglecta, *Kunth*, Enum. Plant. Vol. I. p. 242.

Leaves narrowly linear, flaccid, with a few slender nearly equal finely pubescent ribs and finely scabrous margins; sheaths smooth, the uppermost one about as long as its leaf; ligule short, subquadrate, laciniate. Panicle erect, oblong-lanceolate, rather lax, completely closed before and after flowering, at which time it is widely opened; panicle-branches slightly rough. Spikelets rather closely placed and subunilateral on the ultimate branches of the panicle. Glumes lanceolate, acute, slightly rough on the keel throughout, membranous. Lower pale five-sixths the length of the glumes, shortly bifid, with the lobes short, denticulate and mucronate. Awn from below the middle of the pale, straight, and scarcely extending beyond it. Hairs at the base of the floret, rather numerous, from one-half to three-fourths as long as the glumes, and shorter than the awn. Rudimentary floret represented by a pedicel with an apical tuft of hairs like that at the base of the perfect floret.

Var. α, *genuina.*

PLATE MDCCXXV.

C. stricta, *Hook.* Brit. Fl. ed. iv. p. 34.

Uppermost ligule scarcely so long as broad, very obtuse. Lowest glume lanceolate, gradually tapering to the point; upper glume elliptical-lanceolate, rather abruptly acute. Awn scarcely exceeding the lower pale. Hairs at the base of the florets about half as long as the glumes.

Var. β, *Hookeri.*

PLATE MDCCXXVI.

C. Lapponica, *Hook.* Brit. Fl. ed. iv. p. 34 (non *Hartm.*).

Ligule rather longer than broad, subacute. Both glumes elliptical-lanceolate and abruptly pointed, but the upper one a little broader than the lower. Awn slightly exceeding the lower pale. Hairs at the base of the florets about three-fourths the length of the glumes. Panicle shorter and denser than in var. α.

In marshes on the gravelly shores of lakes. Very rare. Formerly found at Whitemore Marsh, about a mile from Forfar, but now destroyed by drainage; Oakmere, Cheshire. Var. β confined to Ireland. On the shores and islands of Lough Neagh, in the counties Armagh (?),* Antrim, and Derry.

England, [Scotland] (extinct), Ireland (var. β only). Perennial. Summer.

Rootstock shortly creeping, with rather short slender stolons. Stems 1 to 3 feet high, slender, erect, radical leaves very slender, 6 inches to 1 foot long, those of the stem a little broader (about $\frac{1}{12}$ inch broad) and 3 to 6 inches long. Panicle 3 to 8 inches long in the Oakmere plant. Spikelets $\frac{1}{6}$ inch long. Glumes purple with a broad green stripe at the base, ultimately yellowish.

Var. β has the panicle 3 to 4½ inches long, the panicle-branches considerably shorter, the florets much more crowded, the glumes broader, more purple, and the hairs longer. Possibly it ought to be considered a subspecies. I am indebted to Mr. S. A. Stewart, of Belfast, for living roots gathered by the Rev. G. Robinson, from County "Armagh." Mr. Stewart, in a letter dated July 30, 1870, says, "This plant (C. stricta, var. β) is much more rare here than it would seem to be from the books. I cannot find it at Babington's station on Shane's Castle Island. It is certainly extinct on Harbour Island, as I fear is the fate also of Carex Buxbaumii. On the little islet near Magharry it is in some plenty, but the bounds are so small that it will scarcely continue very long even there. The Rev. Mr. Robinson had another station on the County Tyrone shore of Lough Neagh, but he has not seen it for some time, and fears that it has disappeared from that station also." Mr. Stewart could not find a single specimen in the station in County Derry, where he gathered it four years ago.

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* I have been informed that the station supposed to be in Armagh is really in Tyrone.

Narrow Small Reed.

German, *Vernachlässigtes Schilf.*

TRIBE VIII.—PHRAGMITIDEÆ.

Spikelets open during flowering, arranged in a lax open panicle, laterally compressed, each containing 1 to 7 perfect florets, sometimes with a male one at the base. Glumes equal or slightly unequal, as long as or shorter than the florets. Pales 2, scarious, the lower one keeled. Stamens 3. Styles long; stigmas 2, protruded near the apex of the florets, between the margins of the pales. Caryops laterally compressed.

GENUS XXI.—PHRAGMITES. *Trin.*

Spikelets stalked, arranged in a loose open panicle, with elongate branches which are spreading at least during the time of flowering, laterally compressed, open during flowering, each containing from 1 to 6 stalked perfect florets with another male one at the base. Glumes 2, very unequal, the lower one much the smaller, both shorter than the florets, pointed but not awned, parchmentlike. Pales 2, very unequal, membranous, the lower one lanceolate-subulate, entire, not awned, the upper one much smaller, with 2 keels on the back. Axis, with long silky hairs between the florets. Lodicules 2, thick. Stamens 3. Styles 2, elongate; stigmas hairy, protruded at the sides of the flower between the apical margins of the pales. Caryops glabrous, free, oblong-ovoid, scarcely furrowed.

The name of this genus of grasses is derived from φραγμὼν, a hedge.

SPECIES I.—**PHRAGMITES COMMUNIS.** *Trin.*

PLATE MDCCXXVII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXXXV. Fig. 502.
Billot, Fl. Gall. et Germ. Exsicc. No. 90.
Arundo Phragmites, *Linn.* *Sm.* Engl. Bot. ed. i. No. 401; and Engl. Fl. Vol. I. p. 168.

Leaves rough on the edges; ligule composed of very short equal hairs. Glumes very acute, entire at the apex.

Var. α, *vulgaris.* Gren. & Godr.

Arundo Phragmites, "*Merat.*" *Dumort.* Agrost. Belg. p. 125.

Stems erect. Spikelets 3- to 6-flowered.

Var. β, *nigricans.* Gren. & Godr.

A. nigricans, "*Merat.*" *Dumort.* Agrost. Belg. p. 125, and Tab. IX. Fig. 35.
A. Pseudo-phragmites, *Lej.* "Spa. Vol. I. p. 43." Test. *Gren. & Godr.*

Stems erect. Spikelets 1- to 2-flowered. Stems shorter and more slender, leaves narrower and panicle much smaller than in var. α.

Var. γ, *repens.* Meyer.

Stems procumbent, very long, apparently never flowering.

In shallow water by the sides of lakes, ponds, and ditches, in wet woods and damp pastures. Rather common, and generally distributed, extending from Cornwall, the Isle of Wight, and Kent to Orkney and Shetland. Var. β, Yarmouth, Isle of Wight, and probably elsewhere. Var. γ, on the south shore of the Isle of Wight.

England, Scotland, Ireland. Perennial. Late Summer.

Rootstock extensively creeping, thick, and articulated. Stems stout, 3 to 8 feet high or more in var. α. Radical leaves, none. Leaves numerous, often secund, the longest 9 to 18 inches long by $\frac{3}{4}$ to $1\frac{1}{2}$ inch broad, tapering towards the base, and for a greater distance to the acute apex, firm, with numerous close ribs, every fourth or fifth of which is thicker than the others, dark dull green, slightly glaucous; ligule reduced to a circle of very short white hairs. Panicle 5 inches to 1 foot long, with numerous long branches, which are at first erect, then drooping to one side, and ultimately spreading in all directions and the longer ones slightly drooping, the lowest ones with long hairs round their base. Spikelets $\frac{1}{3}$ to $\frac{1}{2}$ inch long, purplish-black, tinged with brown. Hairs on the axis between the florets very numerous, white, silky, shorter than the pales. The lower pale with a long subulate point, purplish-black.

Var. β is probably merely a depauperate state of Ph. communis, though the acute Dumortier admits it as a species. In it the stems are from 18 inches to 3 feet high. Leaves 2 to 5 inches long by ¼ to ⅜ inch broad, more glaucous than in var. α. Panicle 3 to 6 inches long, with the spikelets blacker than in var. α, each containing a single male floret, sometimes with 1 female one above it.

Var. γ I have not seen. Dr. Bromfield describes it as springing from the steep slipped banks of wet clay on the southern shores of the Isle of Wight, with the stems "depending like long and slender ropes, or trailing in a straight or serpentine direction, on the shingly beach or smooth and level sand, and that without rooting at the joints, to the length of 20, or 40, or even 50 feet. I have never observed the extremities of the stolons to blossom under these circumstances, as indeed they could scarcely be expected to do with so exhausting a length of growth; the leaves too are very short, as if imperfectly developed, and occasionally a few radicles are emitted from one or other of the joints."—"Phytol." vol. i. p. 146.

Common Reed.

French, ***Roseau commun.*** **German,** ***Gemeines Rohr.***

Although this grass has no agricultural merits, yet it is serviceable in many points of view. In Sweden the country people use the panicle to dye woollen cloth green. The reeds are used for thatching, and are found to be more durable than straw. Garden screens are made of them, and they form a good foundation for plaster floors; they are also in demand by brickmakers. Till the introduction (in the seventh century) of pens made from the quills of birds, they were used for writing. They also occasionally serve for arrows. The young shoots when cut off from the root where not exposed to the light, make an excellent pickle. The nest of the sedge-warbler is generally found suspended between the stems at a small height from the ground. Entomologists may often find a considerable variety of insects on the panicles, whither they resort for food and shelter; and the reeds form an excellent protection for wildfowl, and are the resort of the reed-warbler, the bearded titmouse, and the reed-bunting. In addition to these adaptations of the plant, it is extremely servicable on the banks of rivers for binding the soil, and thus enabling it to resist the encroachment of the stream, and much of the low land on the sides of our larger rivers has been reclaimed partly by the growth of the Reed. The creeping stems are very nutritious, containing much sugar, and might be used as fodder in time of scarcity, when they could be destroyed without injury resulting to the adjacent land, which they so often protect.

TRIBE IX.—STIPEÆ.

Spikelets open during flowering, arranged in a lax open or closed panicle, dorsally compressed, each containing a single perfect floret, without the rudiment of a second. Glumes unequal. Pales at length coriaceous, the lower one not keeled. Stamens 3. Styles very short or absent; stigmas 2, protruded at the base of the florets between the margins of the pales. Caryops fusiform, with a furrow on the inner face, closely covered by the pales.

GENUS XXII.—**MILIUM.** *Linn.*

Spikelets stalked, arranged in a loose open panicle with elongate branches which are spreading at least during the time of flowering, slightly dorsally compressed, biconvex, open during flowering, each containing a single perfect floret, without the rudiment of another. Glumes 2, nearly equal, as long as the florets, concave, pointed but not awned, subherbaceous. Pales 2, equal, shining, not keeled, not awned, not bearded at the base, subcoriaceous ultimately undurated, the upper one concave, notched at the apex, embraced by the lower one. Lodicules 2, entire. Stamens 3. Styles 2, short; stigmas plumose, protruded at the sides of the floret between the basal margins of the pales. Caryops glabrous, free, oblong, dorsally compressed, flattened and furrowed on the inner face.

The name of this genus of grasses is derived from *mille*, a thousand, or the Celtic word *mil*, a stone, in allusion to the number or the hardness of its seeds.

SPECIES I.—**MILIUM EFFUSUM.** *Linn.*

PLATE MDCCXXVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. LXXXVI. Fig. 159.
Billot, Fl. Gall. et Germ. Exsicc. No. 1585.
Agrostis effusa, *D.C.* Fl. Fr. Vol. III. p. 21.

Perennial. Stem smooth. Leaves broadly linear. Panicle large, compound, lax; panicle-branches capillary, very unequal, slightly rough, in half whorls, spreading-deflexed. Spikelets distant. Glumes oval, acute, very slightly shagreened.

In woods. Not uncommon in England. More rare in Scotland, at least to the north of the Forth and Clyde, but extending to Argyle and Moray. Rather rare in Ireland, but widely distributed.

England, Scotland, Ireland. Perennial. Summer.

Rootstock shortly creeping, producing short stolons and tufts of stems and leafy barren shoots. Stems 2 to 4 feet high, smooth, leafy throughout. Leaves broad, flaccid, 4 inches to 1 foot long by $\frac{1}{2}$ to $\frac{3}{4}$ inch broad, gradually tapering to the point, with nearly smooth slender ribs, of which every third or fourth is stronger than the others, pale bright glossy green; uppermost sheath longer than its leaf, smooth; ligule long, obtuse, enfolding the stem in the lower half. Panicle 4 to 15 inches long, very lax, with long smooth capillary spreading branches, unbranched for half of their length, or more. Spikelets $\frac{1}{8}$ inch long. Glumes pale green, rather dim, with numerous very minute rounded points on their surface, and 3 faint ribs. Outer pale a little shorter than the glume, ultimately hard, shining, and yellowish. Anthers yellow.

Plant with much the habit of the lax-panicled species of the genus Panicum, to which some authors think Milium allied, considering that the lower glume is wanting, and what is here described as the lower glume is really the upper glume, and the apparent upper glume is the solitary pale of a neuter floret.

Wood Millet Grass.

French, *Millet étalé.* German, *Gemeines Flattergras.*

This grass in its natural state seems to be confined to woods as its place of growth. When transplanted, however, it will thrive and grow in open exposed situations. Birds are remarkably fond of the seeds; and near game covers a better grass cannot be encouraged, as it saves the cornfields.

TRIBE X.—AVENEÆ.

Spikelets open during flowering, arranged in a lax open panicle or rarely in a cylindrical or ovoid spikelike panicle, cylindrical or slightly laterally compressed, each containing commonly 2 or 3 perfect florets, sometimes the upper one neuter, and very rarely the lowest one male; rarely there are 4 to 9 perfect florets. Glumes usually as long or longer than the florets. Pales herbaceous or scarious, the lower one rounded or keeled on the back, often ultimately indurated, with a dorsal awn which is commonly twisted and bent. Style very short or absent; stigmas 2, protruded at the base of the florets between the margins of the pales, or rarely included. Caryops dorsally compressed and furrowed, or slightly laterally compressed, and without a furrow.

GENUS XXIII.—**CORYNEPHORUS.** *Pal. de Beauv.*

Spikelets stalked, arranged in a rather compact panicle with short branches which are spreading only during the time of flowering, slightly laterally compressed, biconvex, open during flowering, each containing 2 perfect florets, the lower one sessile, the upper one stalked. Glumes 2, nearly equal, longer than the florets, keeled, pointed but not awned, scarious. Pales 2, unequal, scarious, the lower one concave, entire, acute, with a straight dorsal awn, which is jointed in the middle and slightly clavate in the upper portion, and with a ring of hairs surrounding the articulation; upper pale 3-toothed at the apex, 2-ribbed. Lodicules 2, bifid. Stamens 3. Stigmas 2, terminal, sessile, plumose, protruded at the sides of the florets, between the basal margins of the pales. Caryops glabrous, ovoid, with a narrow furrow on the inner face.

The name of this genus of grasses is derived from the Greek words κορύνη, a club, and φορός, bearing.

SPECIES I.—**CORYNEPHORUS CANESCENS.** *Pal. de Beauv.*

PLATE MDCCXXIX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. XCIV. Fig. 178.
Billot, Fl. Gall. et Germ. Exsicc. No. 91.
Aira canescens, *Linn.* *Sm.* Engl. Bot. ed. i. No. 1190; and Engl. Fl. Vol. I. p. 105. *Hook. fil.* Stud. Fl. p. 437.

Perennial. Stems fasciculate, usually geniculate at the base. Radical leaves densely fasciculate, very numerous, setaceous, very rough, glaucous. Panicle oblong-lanceolate and open during flowering, afterwards closed, narrowly oblong, and lobed; panicle-branches short. Awn a little shorter than the glumes, its terminal portion filiform, gradually dilated upwards until at the apex it becomes nearly as broad as the lower portion.

On sandy coasts. Very rare. The only places in Britain where there can be no doubt that it occurs are Lowestoft Denes, in Suffolk, and Yarmouth Denes, Norfolk. In Jersey it occurs on the Quenvais, and on the sands of St. Brélade's and St. Aubin's Bays. It has been reported from the counties of Somerset, Dorset, Kent, and Nottingham; the last almost certainly erroneously, and the others requiring confirmation.

England. Perennial. Summer.

Plant growing in loosely cohering but very dense tufts, with innumerable fascicles of slender setaceous radical leaves, 1 to 3 inches long, very glaucous, with purplish sheaths. Flowering stems 2 to 9 inches high, with a few short leaves. Upper sheath much longer than its leaf, which is rarely more than ⅓ inch long, with a long lanceolate acute ligule. Panicle ½ to 2½ inches long. Spikelets ⅙ inch long. Glumes nearly equal, elliptical-lanceolate, acuminate, longer than the florets, silvery white, with a green or purple shade on each side of the keel when in flower, afterwards wholly yellowish-white. Axis hairy beneath the florets, the second one a little elevated above the lowest. Awn from about the middle of the lower pale, divided into two nearly equal portions by a ring of hairs at about the level of the apex of the lower pale; the lower portion thick, the upper very slender at the base, but gradually thickening nearly to the apex. Anthers dark purple.

Grey Hair-Grass.

French, *Corynéphore blanchâtre.* German, *Graues Silbergras.*

GENUS XXIV.—**AIRA.** *Linn.*

Spikelets stalked, arranged in a loose or rarely compact panicle with long (rarely short) branches which are spreading at least during the time of flowering, laterally compressed, biconvex, open during flowering, each containing 2 or rarely 3 perfect florets, or 2 perfect florets and a stalklike rudiment, all the florets sessile, or the upper one or ones stalked. Glumes 2, nearly equal, as long as or longer than the florets, keeled, scarious. Pales 2, unequal, scarious, the lower one concave, rounded on the back, bifid or denticulate at the apex, usually with a dorsal awn, which is bent, more rarely straight, but never articulated or clavate, nor surrounded by a ring of hairs in the middle, usually from below the middle of the pale. Upper pale bifid, 2-ribbed. Lodicules 2, lanceolate, entire. Stamens 3. Stigmas 2, terminal, subsessile, plumose, protruded at the base of the florets between the margins of the pales. Caryops glabrous, fusiform, flat, or with a narrow furrow on the inner face.

The derivation of the name of this genus of grasses is from αἴρειν, to hurt, on account of the supposed poisonous qualities of some of the species.

SECTION I.—DESCHAMPSIA. *Pal. de Beauv.*

Perennial. Spikelets sub-compressed, with 2 perfect florets and the rudiments of a third above them; the second floret distinctly stipitate. Lower pale scarious, smooth, not hardening over the caryops, truncate and denticulate at the apex. Awn dorsal, not evidently twisted at the base, slightly incurved, but not distinctly geniculate.

SPECIES I.—AIRA MAJOR.

PLATES MDCCXXX. MDCCXXXI.

A. cæspitosa, *Benth.* Handbk. Brit. Bot. ed. ii. p. 537. *Hoop. fil.* Stud. Fl. p. 436.

Perennial. Densely cæspitose. Radical leaves firm, linear, flat, with broad very prominent slightly rough cartilaginous ribs, and very rough margins, dull green, sometimes slightly glaucous above. Stem leaves few, similar to the radical ones, the upper one much shorter than its sheath; sheaths smooth or nearly so; ligule long, acute, laciniate. Panicle lax or rather lax, pyramidal, drooping at the apex, open while in flower and more or less so after flowering; panicle-branches slender, spreading, and the longer ones often slightly recurved, rough or smooth. Spikelets numerous, on thick pedicels, shorter than the spikelets. Lower pale truncate and with 4 small teeth at the apex. Awn dorsal, from near the base or above middle of the pale, slightly incurved, not distinctly twisted at the base, rarely extending beyond the pale, and never more than one-fourth beyond it, scarcely exceeding the glumes. Second floret shortly stipitate; third floret reduced to a pedicel with a small apical tuft of hairs resembling that at the base of the two perfect florets.

SUB-SPECIES I.—**Aira cæspitosa.** *Linn.*

PLATE MDCCXXX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. XCVI. Figs. 185 to 189.
Billot, Fl. Gall. et Germ. Exsicc. No. 1587.

Panicle-branches all spreading or slightly reflexed, rough. Glumes rough on the keel. Awn from immediately above the base of the pale, and usually slightly exceeding it.

Var. α, *genuina.*

Leaves long, ultimately slightly arching outwards. Panicle large, very lax. Spikelets small, silvery-grey or yellowish-white.

Var. β, *brevifolia.* Parnell.

Leaves short, straight. Panicle smaller and more compact than in var. α; the spikelets a little larger, purplish-lead-colour with whitish margins.

Var. γ, *Pseud-alpina.*

Leaves short, straight. Panicle similar to that of var. β, but with smoother panicle-branches. Spikelets larger, pale olive, often tinged with purplish lead-colour or green, usually if not always viviparous.

Var. α in meadows and moist woods and by roadsides. Common, and generally distributed. Var. β in upland districts and on mountains. Common. Var. γ on mountains, but rather scarce.

England, Scotland, Ireland. Perennial. Summer.

Var. α has the rootstock densely cæspitose. Radical leaves 1 to 2 feet long, by $\frac{1}{6}$ to $\frac{1}{4}$ inch broad, with 3 or 4 broad ribs on each side of the midrib clothed with minute asperities pointing forward; the marginal ribs with larger prickles, also pointing towards the apex of the leaf. Stem 2 to 4 feet high, with its leaves much shorter than the radical ones, but otherwise resembling them, flat, but as well as the radical ones becoming involute when dry. Panicle 6 to 15 inches long, by about half as broad. Spikelets very numerous, $\frac{1}{5}$ inch long.

Var. β has the stems 15 inches to 2 feet high; the radical leaves 2 to 6 inches long, and erect, not arching as in var. α; the panicle more compact, 2 to 4 inches long; the spikelets a little larger, and much more deeply coloured.

Var. γ is similar to var. β in its short leaves and low stems. Panicle 4 to 8 inches long, almost always viviparous. Spikelets nearly $\frac{1}{4}$ inch long.

Tufted Hair-Grass.

French, *Canche gazonnante*. German, *Rosenförmige Schmiele*.

This grass, according to Parnell, has a most unsightly appearance in meadow-pastures and parks, as it grows into large tufts, and forms irregularities on the surface, which are termed by farmers rough cups or hossacks, and are difficult to get rid of. From the extreme roughness and coarseness of the leaves cattle seldom touch it, and as it contains but little nutritive matter it is not worth the attention of the agriculturist. It is a sure indication, wherever found on the farm, that the land wants underdraining, without which no cutting it out will destroy it. But the efficiency of drainage, where it occurs, is seen by its dying away and scattering the fields with its turned up rough bunches of dried leaves. Its flowering-panicles are very beautiful, and vary considerably both in size and colour.

SUB-SPECIES II.—**Aira alpina.** *Linn.*

PLATE MDCCXXXI.

A. lævigata, *Sm.* Engl. Bot. ed. i. No. 2162.
Deschampsia alpina, *Röm. & Schultes*, Syst. Veg. Vol. II. p. 686.

Upper panicle-branches ascending; lower ones spreading, all smooth. Glumes smooth on the keel, or slightly rough towards the apex only. Awn from above the middle of the pale, and but slightly exceeding it.

On rocky débris on high mountains. Rare. Most plentiful on the Braemar Mountains, and on Loch-na-gar. I have specimens also from Ben Voirlich, and it is said to have occurred in many other places in the Highlands, but it has been so confounded with the var. γ of A. cæspitosa, that it is impossible to trust to records, unless authenticated by specimens.

Scotland. Perennial. Late Summer, Autumn.

In the wild specimens, the stems are from 4 to 15 inches high, the leaves 2 to 6 inches long by $\frac{1}{6}$ to $\frac{1}{8}$ inch broad, rather smoother than those of A. cæspitosa; the panicle from 1 to 4 inches long, with fewer and considerably larger spikelets than in A. cæspitosa, vars. α and β, but undistinguishable from those of var. γ, except by the smoother midrib. I have never gathered any but viviparous specimens, and all my Scandinavian specimens of A. alpina are also viviparous.

I can see no invariable difference between A. cæspitosa and A. alpina, except that in the former the awn is inserted below the middle of the pale, and in A. alpina above it. The awn in A. alpina is certainly not more bent nor more twisted at the base than that of A. cæspitosa.

Alpine Hair-Grass.

SECTION II.—AVENELLA. *Koch.*

Perennial. Spikelets scarcely compressed, with 2 perfect florets, but no third rudimentary one, the second floret distinctly stipitate. Lower pale subscarious, slightly rough with minute blunt points, not hardening over the caryops, truncate and denticulate at the apex. Awn dorsal, evidently twisted at the base, geniculate. Florets with conspicuous hairs at the base.

SPECIES II.—**AIRA FLEXUOSA.** *Linn.*

PLATE MDCCXXXII. MDCCXXXIII.

Perennial. Cæspitose. Radical leaves filiform, setaceous, channelled, or folded together, without evident ribs, nearly smooth, dull green or glaucous. Stem leaves few, rough, the upper one much shorter than its sheath; sheaths slightly rough (at least the lower ones); ligule prominent, obtuse or acute, split. Panicle very lax, erect or drooping at the apex, open while in flower, and partially so after flowering. Panicle-branches capillary, flexuous, spreading or ascending-spreading, slightly rough, the secondary branches mostly in pairs, suberect or ascending. Spikelets rather few, on pedicels, longer or shorter than the spikelets. Lower pale truncate, and with 4 small teeth at the apex. Awn dorsal, from near the base of the pale, twisted in the basal half, geniculate in the middle, about half as long as the pales and glumes. Second floret shortly stipitate; third floret wholly absent; axis pubescent beneath the florets or throughout.

SUB-SPECIES I.—**Aira eu-flexuosa.**

PLATE MDCCXXXII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. XCV. Fig. 182.
Billot, Fl. Gall. et Germ. Exsicc. No. 1587.
A. flexuosa, *Arct. Plur.*
Deschampsia flexuosa, *Trin.* *Gren. & Godr.* Fl. de Fr. Vol. III. p. 508.
Avenella flexuosa, *Parl.* Fl. Ital. Vol. I. p. 246.
Avena flexuosa, *Mert. & Koch.* Fl. Deutschl. Vol. I. p. 570.

Leaves filiform, channelled above, with a few prominent lines beneath, firm, nearly smooth, dark green, not glaucous. Ligule of uppermost leaf oblong, obtuse, split, not longer than the diameter of the stem opposite to it. Panicle erect, or rarely slightly drooping at the summit. Pedicels of all the florets slender, equalling or exceeding the spikelets. Second floret very shortly stipitate, the portion of axis between the two being scarcely a fourth of the length of the second spikelet.

Var. *α, genuina.*

Panicle open. Spikelets rather large. Glumes variegated with light purple shading into red, with yellowish-white scarious tips.

Var. *β, montana.*

A. montana, *Linn.* Sp. Plant. p. 96 (ex parte ?).

Panicle contracted, at least after flowering. Spikelets larger than in var. α. Glumes of a much darker purple.

On dry heaths and pastures. Common, and generally distributed.

England, Scotland, Ireland. Perennial. Summer.

Plant growing in rather dense tufts. Stems 1 to 2 feet high, slender, bare of leaves at the apex. Radical leaves numerous, 1 to 7 inches long, very slender, subcylindrical, with a shallow channel on the upper surface, and a few prominent ribs on the under. Uppermost stem leaf 1 to 2 inches long. Panicle 2 to 4 inches long. Spikelets mostly at the apex of the branches, $\frac{1}{5}$ to $\frac{1}{4}$ inch long. Glumes shorter than the florets, shining. Axis shortly bearded beneath the florets. Pales with minute raised points. Awns brownish, usually about one-fourth longer than the pale.

The var. montana bears the same relation to the normal form of A. flexuosa that var. brevifolia does to the normal form of A. cæspitosa.

Heath Hair-Grass.

French, *Deschampsie flexueuse.* German, *Geschlängelte Schmiele.*

SUB-SPECIES II.—**Aira uliginosa.** *Weihe.*

PLATE MDCCXXXIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. XCV. Figs. 183 and 184.
Billot, Fl. Gall. et Germ. Exsicc. No. 2174.
A. flexuosa, var. β, *Hook. fil.* Stud. Fl. p. 436.
A. discolor, "*Thuill.*" *Dumort.* Agrost. Belg. p. 130.
A. setacea, *Huds.* Fl. Angl. ed. i. p. 30, test. *Trimen*, Journ. Bot. 1869, p. 342.
Deschampsia Thuillieri, *Gren.* & *Godr.* Fl. de Fr. Vol. III. p. 508.
D. discolor, *Crep.* Fl. Belg. ed. ii. p. 342.

Leaves filiform, conduplicate, with a few prominent lines beneath, flaccid, nearly smooth, pale glaucous green. Ligule of uppermost leaf linear-lanceolate, very acute, lacerate, five or six times the diameter of the stem opposite to it. Panicle drooping at the summit. Pedicels of the lateral florets thickened upwards, shorter than the spikelets. Second floret usually longly stipitate, the portion of the axis between the two being often equal to half the length of the second spikelet.

In wet turfy bogs. Apparently local, but probably widely distributed. Fleetpondnorth, Hants; Woking Common, Surrey; Stratton Heath (?) and Cawston Decoy, Norfolk. Forfarshire; "Loch of Drum," Kincardineshire, "Loch Connor, Aberdeenshire," Dr. J. Roy. Near Clifden Roundstone and Kilkieran, Connemara.

England, Scotland, Ireland. Perennial. Summer.

Very near A. eu-flexuosa, but the radical leaves are longer (3 to 8 inches), more slender, not semicylindrical, but folded into a gutter, and very glaucous; the ligule of the uppermost stem leaf is five or six times longer and very acute; the panicle is usually longer, sometimes 5 or 6 inches; the spikelets are $\frac{1}{5}$ inch long, more numerous and more racemose; the second spikelet usually more longly stalked; the glumes more nearly equal, paler, and sooner becoming of a dull yellowish-olive; the awn longer in proportion to the pales and glumes than in A. eu-flexuosa.

From Dr. Trimen's notes in the "Journal of Botany," referred to above, it seems probable that Hudson, in the first edition of "Fl. Anglica," had this plant in his mind when he described his A. setacea, but in his second edition he referred his A. setacea to A. montana *Linn.*, and by the localities he stated for it, he certainly confused A. uliginosa with forms of A. eu-flexuosa. Dr. Trimen, however, contends that the name "A. setacea" ought to be revived.

The practice of raking up an obsolete name is always highly objectionable, and the obsolete in the present case is not likely to be adopted. Publishing botanists will reserve to themselves the right of correcting their opinions during their lifetime, and if their views alter, will demand to be judged by their latest published opinions. In the case of A. setacea, no doubt, Hudson's first impression was right, but an exceptional case like this is no ground for establishing a precedent for depriving botanists of the right to withdraw statements which they subsequently believe to be erroneous.

Bog Hair-Grass.

German, *Sumpf-Schmiele.*

SECTION III.—AIRELLA. *Dumort.*

Annual. Spikelets with 2 perfect florets, but no third rudimentary one; the second floret sessile, or very shortly stipitate—the axis not being developed between it and the first floret, or but slightly developed. Lower pale at first subscarious, but at length becoming hardened over the caryops, bifid, with 2 rather long acute subsetaceous cusps at the apex. Awn dorsal, evidently twisted at the base, geniculate. Florets without hairs at the base, or with very short ones.

SPECIES III.—**AIRA CARYOPHYLLEA.** *Linn.*

PLATE MDCCXXXIV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. XCIV. Fig. 180.
Billot, Fl. Gall. et Germ. Exsicc. No. 481.
Avena caryophyllea, *Wigg.* *Koch,* Syn. Fl. Germ. et Helv. ed. ii. p. 922.
Airopsis caryophyllæa, *Fries,* Summ. Veg. Scand. p. 78.

Annual. Radical leaves none. Stem leaves setaceous, involute, deeply channelled, slightly rough, pale green, the uppermost one much shorter than its sheath; sheaths smooth or nearly so; ligule prominent, rather long, lanceolate, acute, nearly entire. Panicle very lax, erect, open while in flower, and open or slightly closed afterwards; panicle-branches capillary, ascending or ascending-spreading, smooth or very slightly rough, subtrichotomously branched, the ultimate branches in corymbs or racemes, divaricate or erect. Spikelets numerous, on unequal pedicels, some shorter and some longer than their spikelets, or (more rarely) all longer than their spikelets. Glumes longer than the florets. Lower pale terminating in 2 long narrow tapering acute serrated cusps. Awn dorsal, from near the middle of the pale, twisted in the basal half, geniculate about the middle, about half as long as the pale, and from one-third to half as long as the glumes, present in both florets, or rarely absent in the lower one (?). Second floret sessile or subsessile; third floret wholly absent. Florets with tufts of very short hairs at the base.

Var. α, *genuina.*

A. caryophyllea, *Bor.* Fl. du Centr. de la Fr. ed. iii. p. 701.

Stems few from each root, short. Panicle short, somewhat triangular; panicle-branches ascending after flowering. Spikelets few, in lax corymbs at the extremity of the branches of the panicle. Florets both sessile and both awned.

Var. β, *patulipes.*

A. patulipes, *Jord.* *Bor.* Fl. du Centr. de la Fr. ed. iii. p. 701.

Stems rather numerous from each root, short. Panicle subtriangular; panicle-branches spreading, divaricate after flowering. Spikelets few, larger than in var. α, in lax corymbs at the extremity of the branches of the panicle. Florets both sessile, and both awned.

Var. γ, *aggregata.*

A. aggregata, *Timeroy*, and A. plesiantha, *Jord.* *Bor.* Fl. du Centr. de la Fr. ed. iii. pp. 701, 702.

Stems numerous from each root, tall. Panicle oblong; panicle-branches ascending, erect after flowering. Spikelets numerous, smaller than in vars. α and β, aggregated into rather dense racemes at the extremity of the panicle-branches. Florets both sessile, and both awned.

In dry fields and waste places, and on rocks and banks. Common, and generally distributed. The distribution of the varieties I am unable to give, having few specimens of A. caryophyllea, which have not been collected by myself. I possess var. α from Somerset, Surrey, Norfolk, and Fife; var. β from Richmond, Yorkshire, collected by Mr. J. Ward; var. γ from Clackmannanshire, Kincardineshire, and Orkney.

England, Scotland, Ireland. Annual. Summer.

Stems 3 to 8 inches high in vars. α and β, 8 to 16 inches in var. γ. Leaves ½ to 1½ inch long; uppermost sheath slightly swollen, with broad white scarious margins. Panicle in var. α and β 1 to 2 inches; in var. γ 1 to 4 inches. Spikelets about ⅛ inch long, rather less in var. γ, and rather larger in var. β, silvery-grey, slightly tinged with purple towards the tip; the extreme tip of the glumes white. Lower pale ultimately hard, rough with small points, brown.

The varieties above enumerated pass so insensibly into each other, that I should not have noticed them had they not been described as species, not only by M. Jordan, but also by the more judicious Professor Boreau. Besides these varieties there exists in France and Belgium another, called A. multiculmis by M. Dumortier, and accepted as a species by MM. Jordan and Boreau. It is very likely to occur in England, although I have not seen specimens. It most nearly resembles the var. aggregata, but has the panicle still more compact, having somewhat the aspect of Corynephorus canescens. Both the florets are awned, but the second one is shortly stipitate.

A. Provincialis (*Jord.*) is perhaps another variety, found in the south of France, and not likely to occur in Britain. It is readily distinguished by the lower floret not being awned.

There is a closely allied species, or possibly only well-marked subspecies of A caryophyllea, viz. A. capillaris, *Mert.* & *Koch*, common in the south of Europe, with much smaller spikelets, a more lax panicle, and the lower floret (or both florets) without an awn, to which A. elegans, *Gaud.*, A. Tenorii, *Guss.*, and A. Cupaniana, *Guss.*, are to be referred, A. Provincialis, *Jord.*, being the connecting link, which possibly ought to be referred to this second subspecies.

Silvery Hair-Grass.

French, *Canche caryophyllée.* German, *Nelkenblättriger Hafer.*

SPECIES IV.—**AIRA PRÆCOX.** *Linn.*

PLATE MDCCXXXV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. XCIV. Fig. 179.
Billot, Fl. Gall. et Germ. Exsicc. No. 884.
Avena præcox, *Pal. de Beauv.* *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 922.
Airopsis præcox, *Fries*, Summ. Veg. Scand. p. 78.
Trisetum præcox, *Dumort.* Agrost. Belg. p. 122.

Annual. Radical leaves none. Stem leaves setaceous, deeply channelled, involute, rough, pale green, the uppermost one very much shorter than its sheath; sheaths smooth; ligule prominent, lanceolate, lacerate. Panicle dense, often spikelike, erect, closed during flowering and afterwards; panicle-branches very short, capillary, erect, simple or nearly so. Spikelets few, on unequal pedicels, some as long as and others shorter than the spikelets. Glumes about as long as the spikelets. Lower pale terminating in 2 long tapering acute serrated cusps. Awn dorsal, from one-third above the base of the pale, twisted in the lower half, geniculate about the middle, from half to two-thirds as long again as the pales and glumes, that of the lower floret sometimes much shorter than that of the upper one. Second floret subsessile or very shortly stipitate; third floret wholly absent. Florets with tufts of short hairs at the base.

On dry banks, rocks, and wall-tops, and in sandy pastures. Rather common, and generally distributed.

England, Scotland, Ireland. Annual. Early Summer.

Plant growing in small tufts, with few or numerous stems 1 to 8 inches high, erect or ascending, or sometimes decumbent. Leaves $\frac{1}{2}$ to $1\frac{1}{2}$ inch long, the uppermost leaf $\frac{1}{8}$ to $\frac{1}{2}$ inch long; panicle $\frac{1}{4}$ to $1\frac{1}{4}$ inch long, always contracted. Spikelets $\frac{1}{8}$ inch long, pale green. Glumes green with broad white scarious margins, acute, rough on the keel. Lower pale ultimately hard, rough with small points, brown.

In the usual state of this plant, the panicle is continuous, but in luxuriant forms it is sometimes interrupted; each of the panicle-branches bears rarely more than 3 spikelets, arranged in a racemose manner.

When in flower it cannot be confounded with any other British grass, but in its earlier stage it bears a striking resemblance to starved specimens of A. caryophyllea, before the panicle of the latter opens; and as A. caryophyllea is from a fortnight to three weeks later in flowering than A. præcox, it is possible that some of the records of A. præcox belong to A. caryophyllea. My own experience is that though A. præcox is as widely distributed as A. caryophyllea, it is less abundant.

Early Hair-Grass.

French, *Canche précose.* German, *Frühzeitiger Hafer.*

GENUS XXV.—**AVENA.** *Linn.*

Spikelets more or less distinctly stalked, arranged in a loose open or compact panicle, which is rarely reduced to a racemose or very rarely to a compact spikelike panicle, at first cylindrical, afterwards slightly laterally compressed, open during flowering, each containing 2 to 8 florets, the lower one sometimes male, the upper one often imperfect or even reduced to a terminal stalklike rudiment. Glumes 2, equal, as long as or longer than the florets, or unequal, and then commonly shorter than the florets, usually keeled, not awned, subherbaceous or subscarious. Pales 2, unequal, the lower one bifid or bicuspidate at the apex, with a bent and twisted dorsal awn from about the middle (at least in some of the lower florets), ultimately parchment-like, coriaceous or membranous. Upper pale 2-toothed, rarely entire, 2-ribbed, membranous. Lodicules 2, entire or bilobed. Stamens 3, rarely 2. Stigmas 2, terminal, sessile or subsessile, plumose, protruded at the sides of the floret, near the basal margins of the pales, or always included within them. Caryops downy at the apex or glabrous, with or without a furrow on the inner face.

The derivation of the name of this genus of grasses is from *aveo*, to desire, because cattle are fond of it.

SUB-GENUS I.—TRISETUM. *Pers.*

Perennial. Spikelets small, compressed. Glumes subscarious, 1- to 3-nerved. Lower pale permanently membranous, keeled, awned. Caryops subcylindrical, not furrowed, usually glabrous.

SPECIES I.—**AVENA FLAVESCENS.** *Linn.*

PLATE MDCCXXXVI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CII. Figs. 204 to 206.
Billot, Fl. Gall. et Germ. Exsicc. No. 1374.
Trisetum flavescens, *Pal. de Beauv.* *Bab.* Man. Brit. Bot. ed. vi. p. 410. *Kunth,* Enum. Plant. Vol. I. p. 298. *Fries,* Summ. Veg. Scand. p. 78. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 523. *Crep.* Man. Fl. Belg. ed. ii. p. 344. *Parl.* Fl. Ital. Vol. I. p. 260. *Dumort.* Agrost. Belg. p. 122.
T. pratense, *Pers.* Syn. Plant. Vol. I. p. 97.

Perennial. Rootstock shortly creeping, stoloniferous. Stems rather few in each tuft, glabrous, with pubescent knots. Leaves linear, flaccid, thin, with numerous slender slightly raised ribs, pubescent above, but scarcely so beneath, green; lower sheaths pubescent, the upper ones nearly glabrous; ligule very short, truncate. Panicle erect, equal, open during flowering, loosely closed afterwards, when it becomes cylindrical, lobed and dense; panicle-branches numerous, slender, rough, the shorter ones of each node of the rachis with spikelets nearly to the base. Pedicels shorter than the spikelets, except the terminal ones, which usually exceed them. Spikelets erect, very numerous, at first linear-elliptical, afterwards narrowly oblong-wedgeshaped, 3- to 6-flowered, shining, pale green, rarely with violet markings, ultimately yellowish-olive. Glumes very unequal, rough on the keel, acuminate, the lower one about half as long as the florets and 1-nerved, the upper one nearly as long as the florets and 3-nerved. Lower pale rather suddenly acuminated, terminated by 2 setæ, permanently scarious throughout. Awn from about one-third below the apex of the pale, that of the lowest floret nearly twice as long as the upper glume. Axis hairy between the florets, which, however, have not hairs at their base.

On dry pastures, banks, and waste places. Rather common.

Generally distributed in England; more rare in Scotland, extending north to Aberdeen and Stirling. Not common in Ireland, and there found chiefly in the south and middle of the island.

England, Scotland, Ireland. Perennial. Summer.

Rootstock shortly creeping, producing at its apex a small dense tuft consisting of stems and barren shoots, and producing rather short slender subterranean stolons, which in the succeeding year produce tufts similar to those of the parent, from which they become disconnected. Stems 9 inches to 2 feet high. Longest leaves 2 to 4 inches long by $\frac{1}{8}$ to $\frac{1}{4}$ inch broad, gradually tapering. Panicle 2 to 6 inches long. Spikelets $\frac{1}{5}$ to $\frac{1}{3}$ inch long, exclusive of the awns.

On the Continent a variety of this plant occurs, with the spikelets variegated with violet, but I have seen no British specimens of this form.

Yellow Oat-Grass.

French, ***Avoine cultivée.*** **German,** ***Gemeiner Hafer.***

This is our smallest-flowered Oat-grass, and is distinguished by its panicles of delicate yellow-coloured finely-awned florets. It is frequent in the meadow, and even on upland heaths, especially on limestone soils. It is a somewhat late species, but its lightness and single scattered mode of growth render it of little value to the farmer.

SUB-GENUS II.—AVENASTRUM. *Koch.*

Perennial. Spikelets erect, large or rather large, slightly compressed. Glumes subscarious, 1 to 3-nerved. Lowest floret perfect. Lower pale scarious, at length parchment-like, not keeled, awned. Caryops fusiform, with a furrow on the inner face, pubescent at the apex.

SPECIES II.—**AVENA PUBESCENS.** *Linn.*

PLATE MDCCXXXVII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CV. Fig. 213.
Billot, Fl. Gall. et Germ. Exsicc. No. .
Trisetum pubescens, *Röm. & Schultes.* Syst. Veg. Vol. II. p. 662. *Dumort.* Agrost. Belg. p. 122. *Parn.* Grasses of Britain, p. 124.

Perennial. Rootstock shortly creeping, stoloniferous. Stems solitary or few in each tuft, erect, wholly glabrous. Leaves broadly linear, rather flaccid, thin, flat, with numerous slender scarcely raised ribs, pubescent at the edges, green on both sides; sheaths pubescent or subglabrous; ligule prominent, lanceolate. Panicle erect or slightly drooping at the summit, subracemose or slightly branched, scarcely spreading even during the time of flowering; panicle-branches few, slender, rough. Pedicels shorter than the spikelets. Spikelets erect, few, oblong-wedgeshaped, 2- to 4-flowered, shining, green, variegated with violet and white. Glumes nearly equal, rough on the keel, acuminate, the lower one 1-nerved, the upper one 3-nerved, rather larger than the lower, and nearly as long as the spikelet. Lower pale gradually acuminate, terminated by 2 short acute teeth, ultimately parchment-like with scarious margins. Awn from a little above the middle of the pale, that of the lower floret twice as long as the upper glume. Axis bearded at the base of the florets, the hairs of the second floret more than half the length of its lower pale.

In meadows and by the banks of streams. Rather sparingly but widely distributed, extending from Cornwall, Isle of Wight, and Kent to Orkney and Shetland. Not unfrequent, and generally distributed in Ireland.

England, Scotland, Ireland. Perennial. Summer.

Stems 1 to 2 feet high. Longest leaves 2 to 6 inches long by $\frac{1}{8}$ to $\frac{1}{5}$ inch broad, rather abruptly pointed at the apex. Panicle 2 to 6 inches long. Spikelets $\frac{1}{2}$ to $\frac{3}{4}$ inch long, exclusive of the awns, variegated with pale or dark purple, green, and white. Awns brown.

Downy Oat-Grass.

French, ***Avoine pubescente.*** **German,** ***Weichhaariger Hafer.***

This species is common in mountain pastures, especially in limestone districts, and indeed follows the chalk and oolites into the valleys. Of little agricultural value, it is vapid and sapless, like all grasses of a downy character.

SPECIES III.—**AVENA PRATENSIS.** *Linn.*

PLATES MDCCXXXIX. MDCCXL.

Billot, Fl. Gall. et Germ. Exsicc. No. 883.
Trisetum pratense, *Dumort.* Agrost. Belg. p. 122. *Parn.* Grasses of Britain, p. 122.

Perennial. Densely cæspitose, not stoloniferous. Stems usually numerous in each tuft, ascending, wholly glabrous or slightly scabrous. Leaves narrowly linear, rigid, rather thick, channelled, hooded at the apex, with several thick contiguous raised cartilaginous ribs, scabrous on the edges, glabrous, glaucous above, green beneath; sheaths glabrous or scabrous; ligule prominent, lanceolate. Panicle erect, racemose or slightly branched, not spreading even at the time of flowering; panicle-branches few, slender, rough. Pedicels shorter than the spikelets. Spikelets erect, few, oblong-elliptical, 3- to 6-flowered, shining, pale green, variegated with pale violet and white. Glumes nearly equal, rough on the keel, acuminate, 3-nerved, shorter than the spikelet. Lower pale gradually acuminate, terminated by 2 acute rough teeth, ultimately parchment-like, with scarious margins. Awn from a little above the middle of the pale, that of the lowest floret about twice as long as the upper glume. Axis bearded at the base of the florets, the hairs of the second floret less than a tenth the length of its pale.

Var. α, *genuinum.*

PLATE MDCCXXXIX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CII. Fig. 207.
A. pratensis, *Sm.* Engl. Bot. ed. i. No. 1204; and Engl. Fl. Vol. I. p. 164.

Stem and sheaths cylindrical. Panicle-branches often solitary (at least from the upper nodes of the rachis), short, usually simple, very rarely with even 2 spikelets.

Var. β, *alpina.*

PLATE MDCCXL.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CIV. Fig. 212.
A. alpina, *Kunth*, Enum. Plant. Vol. I. p. 301. *Reich.* Ic. l.c. p. 22. *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 918.
A. planiculmis, *Sm.* Engl. Bot. ed. i. No. 2161 (non *Schrad.*).

Stem and sheaths more or less compressed, the latter rougher and the leaves broader than in var. α. Panicle-branches mostly in pairs, the longer one of each pair usually with 2 or even 3 spikelets, which are considerably larger than those of var. α. Awns of the florets usually longer from the bend to the apex than in var. α.

Var. α on dry pastures, downs, and rocks, particularly of chalk or trap. Rather common, and generally distributed. Var. β on ledges of rocks in mountainous and hilly districts. Apparently neither form has been observed in Ireland.

England, Scotland. Perennial. Summer.

Plant growing in dense tufts somewhat like those of Aira cæspitosa. Leaves of the barren tufts 2 to 9 inches long, $\frac{1}{10}$ to $\frac{1}{8}$ inch broad, often with the sides folded together when growing in very dry places, and the same thing happens whenever the plant begins to wither after being gathered. Stems 6 inches to 2 feet high, bare of leaves towards the apex; the uppermost leaf $\frac{1}{2}$ to 1 inch long, much shorter than its sheath. Panicle 2 to 6 inches long. Spikelets $\frac{1}{2}$ to $\frac{7}{8}$ inch long, exclusive of the awns.

Var. β is a larger, taller, and rougher plant. Leaves sometimes nearly $\frac{1}{4}$ inch broad, and the stems usually 2 to 3 feet high. Panicle

4 to 9 inches long. Spikelets $\frac{3}{4}$ to 1 inch long. Though the extreme examples of the alpine form are very different from A. pratensis of lowland pastures, the transition between the two is so gradual that all idea of separating them into species has been given up by common consent.

A third variety, A. bromoides (*Linn.*), is frequent in the south of Europe. It has the spikelets smaller, although the florets are usually more numerous than in var. α. The glumes and pales are also broader in proportion.

A. pratensis much resembles A. pubescens, but forms dense tufts; the leaves are narrower, thicker, with stronger nerves and rough edges, and are glaucous above and glabrous. The sheaths also are never pubescent, the stems are more rigid, the spikelets larger and usually less highly coloured, and the hairs at the base of the florets are much shorter in A. pratensis than in A. pubescens.

Glabrous Oat-Grass.

French, *Avoine des prés.* German, *Wiesen-Hafer.*

This grass is wrongly named "meadow," as it is seldom if ever found in a position that is worthy of that name. It possesses hard cutting leaves. Sinclair says that "its nutritive matter contains a less proportion of bitter extractive and saline matters than any other of the Oat-grasses that have been submitted to experiment."

SUB-GENUS III.—EU-AVENA. *Gren. & Godr.*

Annual. Spikelets ultimately drooping or nodding, large, scarcely compressed. Glumes herbaceous, many-nerved. Lowest spikelet perfect. Lower pale subherbaceous, at length coriaceous, not keeled, more or less distinctly awned, at least in the lower florets. Caryops fusiform, with a furrow on the inner face, pubescent at the apex.

SPECIES IV.—**AVENA STRIGOSA.** *Schreb.*

PLATE MDCCXL.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CVI. Fig. 217.
Billot, Fl. Gall. et Germ. Exsicc. No. 2768.
Danthonia strigosa, *Pal. de Beauv.* Agrost. p. 160.

Annual. Without radical leaves or barren shoots. Leaves broadly linear, flaccid, thin, flat, with numerous slender rough ribs, every third, fourth, or fifth of which is stronger than the others, green; sheaths smooth; ligule short, laciniate. Panicle erect, lax, permanently secund. Pedicels capillary, mostly shorter than the spikelets. Spikelets drooping, rather numerous, opening but little even at the time of flowering, 2-flowered, rarely 3-flowered, green, sometimes slightly tinged with violet at the base and with dark awns. Glumes nearly equal, as long as the spikelets, herbaceous, with broad scarious margins, the lower one 5- to 7-ribbed, the upper 7- to 9-ribbed. Lower pale lanceolate, gradually acuminate, terminated by 2 long scabrous setæ about half the length of the rest of the pale or more, ultimately coriaceous and brown towards the base, with a few long scattered whitish hairs near the middle or wholly glabrous, 5-nerved, with the nerves conspicuous towards the apex and vanishing towards the base. Awn present in all the florets, from about the middle of the pale, that of the lowest floret about twice as long as the upper glume. Axis not fragile beneath the lowest floret, glabrous, except at the base of the upper floret, the hairs at the base of the second floret scarcely reaching to the base of the pale.

A weed in cultivated fields. Scarcely naturalised in England and the south of Scotland, but frequent in the north, extending to Orkney and Shetland. Rather rare, but widely distributed in Ireland.

[England,] [Scotland,] [Ireland.] Annual. Summer.

Stems 18 inches to 4 feet high. Leaves 6 to 9 inches long by $\frac{1}{4}$ to $\frac{1}{2}$ inch broad. Panicle 4 to 10 inches long. Spikelets all pointing one way, about 1 inch long, exclusive of the awns. Lower pale ultimately brown and coriaceous, whence probably it takes its name of "black oat" in the northern districts, where it is largely cultivated.

A. strigosa much resembles the common cultivated oat, A. sativa, but may be readily recognised by its secund panicle, more slender spikelets terminating in 2 long setæ, which equal the glumes, and always with a long dark-coloured awn. The pale also is much darker coloured, more acuminate, and more strongly nerved towards the apex.

The Tartarian or Potatoe oat, Avena Orientalis, which is also frequently cultivated, especially in Scotland, has the panicle secund as in A. strigosa, but much more narrow and dense, the florets shorter than the glumes, the lower pale not terminating in 2 setæ, the uppermost or even both the florets without an awn.

In A. strigosa and A. Orientalis fertilisation is certainly most commonly if not always effected before the anthers protrude from the pales, by which time they will be found empty of pollen; at least this is the case in the county of Fife. A. sativa, however, though generally fertilised in the same mode, may occasionally be found with protruded anthers still containing pollen.

Black Oat.

French, *Avoine rude.* German, *Rauh- or Sand-Hafer.*

SPECIES V.—AVENA FATUA. *Linn.*

PLATE MDCCXLI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CVI. Fig. 218.
Billot, Fl. Gall. et Germ. Exsicc. No. 1372.

Annual. Without radical leaves or barren shoots. Leaves very broadly linear, flaccid, thin, flat, with numerous slender rough ribs, every third, fourth or fifth of which is stronger than the others, dull green; sheaths smooth; ligule short, laciniate. Panicle sub-erect, very lax, at first subsecund, ultimately spreading in all directions. Pedicels capillary, mostly longer than the spikelets. Spikelets drooping, ultimately pendulous, numerous, opening widely during and after flowering, 3-flowered, more rarely 2-flowered, green, with dark brown awns. Glumes equal, longer than the spikelets, herbaceous, with narrow scarious margins, both commonly with 9 ribs. Lower pale lanceolate, gradually acuminate, terminated by 2 short scabrous setæ less than one-tenth the length of the rest of the pale, ultimately coriaceous and usually dark-brown, with numerous long close yellow or orange hairs on the back and sides, extending from the base to the middle or only at the base, or very rarely wholly glabrous, 5-nerved, the nerves rather faint and vanishing about half-way down towards the base. Awn present in all the florets, from about the middle of the pale, that of the lowest floret about twice as long as the upper glume. Axis fragile beneath the lowest floret, hairy at the base of the florets, the hairs at the base of the second floret extending beyond the base of the pale for about one-third of its length.

Var. α, *pilosissima.* Gray.

Spikelets mostly 3-flowered. Lower pales densely clothed with hairs from the base up to the point where the awn is inserted ultimately dark brown.

Var. β, *intermedia.*

A. intermedia, *Lindgren.* in *Lindbl.* Bot. Not. 1841, p. 151.
A. hybrida *Petermann.* Koch, Syn. Fl. Germ. et Helv. ed. ii. p. 917.

Spikelets 2 or 3-flowered. Lower pales glabrous, except at the base, or, in the lowest floret, with also a few widely scattered hairs about the insertion of the awn, ultimately pale yellowish olive.

A weed in cultivated ground. Not very generally common, but widely distributed in England. Local in Scotland, and probably not native, though it extends to Orkney and Shetland. Rare and local in Ireland, where it occurs in counties Kerry, Cork, and Dublin. Var. β, Claygate, Surrey (Mr. H. C. Watson), Bluntisham, Hunts (Rev. W. W. Newbould); Knutsford, Cheshire (the Hon. J. L. Warren); and doubtless elsewhere.

England, [Scotland], Ireland. Annual. Summer, Autumn.

Stem 2 to 4 feet high, stout. Leaves 6 inches to 1 foot or more long, $\frac{3}{8}$ to $\frac{3}{4}$ inch broad, dull green, darker on the back, often with a few long scattered hairs. Panicle 6 inches to 1 foot or more long. Spikelets $\frac{3}{4}$ to 1 inch long exclusive of the awns. Lower pale ultimately very dark brown in var. α, but much paler in var. β.

A. fatua is readily distinguished from A. strigosa by its very lax panicle ultimately spreading in all directions, by its more equal glumes, which are longer in proportion to the florets, by its lower pale being darker in colour, usually densely clothed in the lower half with bristly hairs, which are at first pale but ultimately become dull yellowish-orange, and having the apex terminated by 2 very short instead of 2 very long setæ.

In habit A. fatua closely resembles the cultivated oat, A. sativa, but it has the panicle larger and more spreading, the florets all awned, the lower pales much darker coloured, more strongly nerved, and usually hairy. The florets in A. fatua open and allow the stigmas to protrude usually before the anthers are empty of pollen; and from the fragility of the axis of the spikelet the florets drop more readily out of the glumes than in either A. strigosa or A. sativa.

The two vars. were first noticed in Britain, as far as I am aware, in Gray's 'Natural Arrangement of British Plants,' where our var. β is made the type of the species; but it seems to be less abundant than our var. α both in Britain and on the Continent.

Wild Oat.

French, *Avoine follette.* German, *Flug- or Wind-Hafer.*

This is one of the most mischievous of agrarian weeds, and, as it grows in corn crops, if its seeds ripen before the corn is cut, the sowing of these render it difficult to get rid of the pest.

Farmers have always held the notion that crop oats degenerated into weed oats, and in some districts they never grew oats as a crop in consequence.*

Sir W. Hooker says, "the cultivated oat, *A. sativa*, differs from this in having one or more upper florets and awnless, in the shorter awn, and in absence of hairs at the base of the florets." But one has only to look attentively at a poor sample of market oats to see the hairs at the base of the floret, and such examples will be furnished with a more or less stiff awn. Poor oats with awns may produce in better soils better oats without awns; whilst good oats without awns, weighing anything over

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* This notion arises from A. fatua often growing with A. sativa, and being more hardy it survives, and A. sativa dies out. It requires a trained eye to distinguish between the grains of A. sativa and A. fatua var. intermedia.—EDITOR.

40 lbs. a bushel, in poor lands soon become awned and weigh under 38 lb. per bushel. No wonder, then, that weight should be made a test of quality.

We conclude, then, that the *A. strigosa*, *A. fatua*, and *A. sativa* are, to say the least, very near relatives.

The use of the wild oat, with its brown hairy seed and twisted awn, as an artificial fly is well known; the uncoiling of the awn when wetted causing those contortions by which it imitates a fly in trouble. It is of common use with rustic fishermen. These awns also make excellent hygrometers, being very sensitive to the humidity of the atmosphere, which causes them to expand; and during dry weather they contract.

SUB-GENUS IV.—ARRHENATHERUM. *Pal. de Beauv.*

Perennial. Spikelets erect, rather large, slightly compressed. Glumes subherbaceous, 1- to 3-nerved. Lower floret usually male. Lower pale subherbaceous, ultimately parchment-like, keeled, conspicuously awned in the lower floret, but very shortly so in the upper one. Caryops elliptical, dorsally compressed with a furrow on the inner face, pubescent at the apex.

The name of this genus of grasses is derived from the words ἄῤῥην, male, and ἀθήρ, an awn.

SPECIES VI.—AVENA ELATIOR. *Linn.*

PLATE MDCCXLII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. XCVIII. Figs. 192 and 193.

Arrhenatherum elatius, *Mert. & Koch. Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 916. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 520. *Parl.* Fl. Ital. Vol. I. p. 293. *Crep.* Man. Fl. Belg. ed. ii. p. 344.

A. avenaceum, *Pal. de Beauv. Bab.* Man. Brit. Bot.! ed. vi. p. 411. *Hook. & Arn.* Brit. Fl. ed. viii. p. 544. *Kunth*, Enum. Plant. Vol. I. p. 307. *Reich*, Ic. l. c. p. 19.

Holcus avenaceus, *Scop. Sm.* Engl. Bot. ed. i. No. 813.

Perennial. Rootstock extensively creeping, without radical leaves, but producing numerous flowering and barren stems. Leaves broadly linear, flaccid, thin, flat, with numerous slender rather rough ribs, every fourth or fifth of which is stronger than the others, deep green; sheaths smooth; ligule short, lacerate. Panicle erect, or sometimes slightly drooping at the apex, lax, spreading in all directions during flowering, closed before and afterwards. Pedicels rough, mostly shorter than the spikelets. Spikelets erect, numerous, opening widely only during flowering, 2-flowered, with the lower flower male, and the upper one perfect, pale green, sometimes tinged with very pale purple. Glumes unequal, herbaceous, with broad scarious margins, the lower one small, 1-ribbed, the upper one twice as long as the lower, and nearly as long as the florets, 3- to 5-ribbed. Lower pale lanceolate, gradually acuminate, terminated by 2 rather short tapering cusps, ultimately parchment-like, hairy or glabrous. Awn of the lower or male flower from about the middle of the pale, and about twice as long as the upper glume, bent in the middle; awn of the upper or perfect floret inserted at the bottom of the notch between the cusps of the pale, straight, and extending but little beyond the pale, being about twice as long as the cusps. Axis not fragile, with a short tuft of hairs at the base of the florets, hairs at the base of the second floret about one-eighth the length of the pale.

Var. α, *genuina.*

A. elatior, *Wild.* Spec. Plant. Vol. I. p. 443.
Arrhenatherum elatius, *Presl.* *Boreau*, Fl. du Centre de la Fr. ed. iii. Vol. II. p. 703.

Lower joints of the stem not swollen. Knots glabrous. Lower pale more or less hairy.

Var. β, *nodosum.* Reich.

A. bulbosa, *Wild.* *D. C.* Fl. Fr. Vol. VI. p. 261.
Arrhenatherum bulbosum, *Presl.* *Boreau*, Fl. du Centre de la Fr. ed. iii. Vol. II. p. 703.

Lower joints of the stem swollen into bulblike knobs, mostly one above the other. Knots of the stem usually pubescent. Lower pale glabrous. Panicle-branches usually shorter than in var α.

In cultivated fields, on banks, and in meadows and woods. Very common, and generally distributed. Var. β nearly as common in some districts as the typical form, especially when the plant grows in cultivated ground.

England, Scotland, Ireland. Perennial. Summer, Autumn.

Stems 18 inches to 6 feet high, slender, terete, smooth. Barren shoots less than half the height of the flowering stems, but also erect; leaves closer together towards the apex. Longest leaves 6 inches to 1 foot long; the uppermost leaf on the flowering stem 2 to 6 inches, the breadth $\frac{1}{4}$ to $\frac{1}{2}$ inch, nearly smooth except on the margins towards the base, but the ribs both above and below are slightly scabrous towards the apex. Panicle 4 to 10 inches long. Spikelets $\frac{1}{4}$ to $\frac{3}{8}$ inch long.

Var. β is remarkable for the super-imposed enlargements at the base of the stem, which are nearly as large as peas: the lower ones are depressed-subspherical, the uppermost one much longer than broad, and gradually tapering upwards.

False Oat-Grass.

French, *Arrhénathère élevée.* German, *Hoher Wiesenhafer.*

This is a large succulent species of grass, greatly aiding the grass crop almost everywhere, but is not much relished on account of the quantity of bitter extractive matter it contains.

The variety *bulbosum* is interesting from the fact that the swollen nodes give the appearance to the quasi roots of a string of small onions; hence the name "Onion Couch." It is common in poor sandy soils, whence it is difficult of eradication.

All the forms of this grass are particularly liable to attacks of *Uredo Segetum.*

GENUS XXVI.—**HOLCUS.** *Linn.*

Spikelets stalked, arranged in a rather loose panicle, with rather elongate branches which are spreading only during the time of flowering, laterally compressed, biconvex, open during flowering, each containing a single perfect floret, with a male floret above it. Glumes 2, nearly equal in length, but the upper much broader than the lower, as long as or longer than the florets, compressed and keeled, not awned, parchmentlike. Pales 2, nearly equal, membranous, or ultimately parchmentlike, the lower one keeled, obtuse, entire, awnless or very rarely awned in the lower floret, but with a dorsal bent awn in the upper floret; upper pale truncate and dentate at the apex, 2-ribbed. Lodicules 2, glabrous. Stamens 3. Stigmas 2, subsessile, plumose, protruded at the sides of the florets between the basal margins of the pales. Caryops free, glabrous, oblong-cylindrical, not furrowed.

The name of this genus of grasses is derived from the Greek words, ὁλκός and ἕλκω, I draw. A name given to plants that were supposed to have the quality of drawing thorns from the flesh.

SPECIES I.—**HOLCUS MOLLIS.**

PLATE MDCCXLIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. XCVII. Fig. 191.
Billot, Fl. Gall. et Germ. Exsicc. No. 2174.
Avena mollis, *Köl.* *D. C.* Fl. Fr. Vol. III. p. 41.

Perennial. Rootstock extensively creeping, producing scattered flowering stems and numerous shorter leafy barren stems, but no radical leaves. Leaves broadly linear, flaccid, thin, flat, with numerous unequal thick slightly prominent ribs, at first pubescent, at length subglabrous, slightly rough on the margins, dull green; sheaths puberulent or subglabrous; ligule short, oblong. Knots of the stem much more densely pubescent than the sheaths. Panicle erect, open during the time of flowering, closed before and after it; panicle-branches short, branched, thinly hairy. Glumes unequal, acuminate, submucronate, longer than the flowers, subglabrous or clothed with very short sparse pubescence, ciliated with stiff hairs on the keel, the upper one larger than the lower, with the lateral ribs rather nearer to the ribs than to the inner margin. Lower pale of the lower or perfect flower glabrous, shining, not awned; pale of the upper or male flower glabrous, shining, awned. Awn from about one-third below the apex of the pale, at first straight, ultimately geniculate, but not hooked, extending beyond the pale about the length of the latter, and about one-third longer than the upper glume, scabrous throughout. Axis with a tuft of unequal hairs at the base of the upper or male floret, varying from a quarter to one-third the length of the pale.

In woods and pastures, and on hedgebanks. Rather common, and generally distributed.

England, Scotland, Ireland. Perennial. Summer.

Flowering stems 18 inches to 3 feet high: barren stems 1 foot to 18 inches. Leaves of the flowering shoots 4 to 8 inches long by $\frac{1}{4}$ to $\frac{1}{3}$ inch broad; those of the barren stems shorter and narrower. Panicle 2 to 5 inches long. Spikelets $\frac{1}{4}$ inch long, whitish. Glumes with the lateral ribs of the upper one and the keel of both green, or rarely purple, their surface clothed with minute tubercles producing short hairs. Anthers dark purple.

Creeping Soft-Grass.

French, *Houlque molle.* German, *Weiches Honiggras.*

This Grass is common on light barren soils, either in woods or open pastures, but neither cows, horses nor sheep thrive on it. Pigs are said to be fond of the roots, which possess a considerable quantity of nutritive matter, having very much the flavour of new meal. It is a mischievous weed when it occurs in arable land, and is only got rid of by deep ploughing, dragging it out, burning it, and afterwards liberally manuring.

SPECIES II.—**HOLCUS LANATUS.** *Linn.*

PLATE MDCCXLIV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. XCVII. Fig. 190.
Billot, Fl. Gall. et Germ. Exsicc. No. 2173.
Avena lanata, *Köl.* *D.C.* Fl. Fr. Vol. III. p. 41.

Perennial. Rootstock densely cæspitose, not creeping, producing tufts of flowering stems and numerous barren shoots so short that the leaves appear to be radical. Leaves broadly linear, thin, flaccid, flat, with numerous slightly unequal thick slightly prominent ribs permanently pubescent, ciliated, but not rough on the margins; sheaths pubescent; ligule short, oblong. Knots of the stem scarcely more pubescent than the sheaths. Panicle erect, open during the time of flowering, closed before and partially closed after it; panicle-branches short, branched, thinly hairy. Glumes unequal, subobtuse, both shortly awned, longer than the flowers, finely pubescent, ciliated with stiff hairs on the keel, the upper one larger than the lower, ovate-oblong and acute in profile, with the lateral ribs about equidistant from the keel and the inner margin. Lower pale of the lower or perfect floret glabrous, shining, not awned. Lower pale of the upper or male floret shining, awned. Awn from about one-fourth from the apex of the pale, and about half as long again as the pale, at first slightly curved and extending a little beyond the glumes, ultimately hooked and included within the glumes, smooth throughout, or scabrous only at the apex. Axis without hairs at the base of the upper or male floret.

In meadows, pastures, woods, hedges, &c. Common, and universally distributed.

England, Scotland, Ireland. Perennial. Summer.

Plant growing in dense tufts. Flowering stems 1 to 2 feet high. Leaves 6 inches to 1 foot long, by $\frac{1}{4}$ to $\frac{5}{8}$ broad, whitish on account of the copious pubescence with which they are clothed. Panicle 2 to 5 inches long, very similar to that of H. mollis, but more pyramidal when in flower. Spikelets $\frac{1}{6}$ inch long, white, often tinged with pink. Anthers dark purple.

Readily distinguishable from the very similar H. mollis by being densely cæspitose, without elongate barren stems; by the leaves and sheaths being copiously pubescent; by the larger glume being broader and not acuminate but more abruptly mucronate or shortly awned; and lastly, by the awn of the upper floret being ultimately hooked and included within the glumes.

Yorkshire Fog.

French, *Houlque laineuse.* German, *Wolliges Honiggras.*

Both this and the previous species are handsome grasses and give great variety to a bouquet of these plants, but are detestable weeds.

H. lanatus affects meadows, where it is quite useless and can only be considered as a diluent in good hay. It is best got rid of by draining and early haymaking. Too much is a perpetual source of annoyance to the farmer, which it is a pity he does not better understand, as it perpetuates evils to allow bad grasses to seed.

If made into hay the seeds are scattered wherever the hay is carried. It has spread all over the United States, no doubt taken there in grass seeds.

TRIBE XI.—FESTUCEÆ.

Spikelets open during flowering, arranged in a lax open panicle, or more rarely in a compact spikelike panicle, rarely unilateral on the branches of a compound spike, or distichous in a simple or subsimple spike or raceme, cylindrical or laterally compressed, each containing 2 to many perfect florets, very rarely with but a single one. Glumes shorter than the florets, rarely equalling them. Pales herbaceous, or at length parchmentlike, the lower one rounded or keeled on the back, obtuse or pointed, without an awn, or with a straight dorsal or apical awn, which occurs chiefly in the species of those genera which have very numerous florets much longer than the glumes. Stamens 3, rarely 2 or 1. Styles very short or absent; stigmas protruded at the base of the florets, between the margins of the pales. Caryops scarcely compressed, usually with a furrow on the inner face.

GENUS XXVII.—**TRIODIA.** *R. Br.*

Spikelets shortly stalked, arranged in a nearly simple distichously subracemose panicle, scarcely compressed, open during flowering, each containing 2 to 5 perfect florets. Glumes 2, nearly equal, as long as or a little shorter than the florets, keeled, pointed, but not awned, subherbaceous. Pales 2, the lower one rounded on the back, 3-toothed at the apex, but not distinctly awned, parchmentlike; upper pale entire, 2-ribbed. Lodicules 3, somewhat fleshy. Stamens 3. Styles 2, short, terminal; stigmas plumose, protruded at the sides of the floret between the basal margins of the pales. Caryops free, glabrous, oval, dorsally compressed, flattened on the inner face, but not furrowed, crowned by 2 minute points.

The name of this genus of plants comes from the Greek words, τρεῖς, three, and ὀδούς, a tooth.

SPECIES I.—**TRIODIA DECUMBENS.** *Pal. de Beauv.*

PLATE MDCCXLV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXVI. Fig. 433.
Billot, Fl. Gall. et Germ. Exsicc. No. 1376.
Poa decumbens, *With.* *Sm.* Engl. Bot. ed. i. No. 792.
Festuca decumbens, *Linn.* Spec. Plant. p. 110.
Danthonia decumbens, *D.C.* *Gren.* & *Godr.* Fl. de Fr. Vol. III. p. 561. *Parl.* Fl. Ital. Vol. I. p. 297. *Crep.* Man. Fl. Belg. ed. ii. p. 344.
Sieglingia decumbens, *Bernh.* *Garcke*, Fl. von Nord- und Mittel-Deutschland, ed. vi. p. 488. *Gren.* Fl. de la Chaine Jurass. p. 905.

Cæspitose. Stem at first decumbent, afterwards ascending or erect while in flower, slightly compressed, smooth, leafy to above the middle and frequently up to the panicle. Leaves rather rigid, narrowly linear, flat at the base, channelled towards the apex, keeled, with numerous strong veins, rough on the edges, glaucous above, green beneath; sheaths thinly pubescent, bearded at the apex; ligule composed of short hairs. Panicle subracemose; panicle-branches erect, 1- to 3-flowered. Pedicels about as long as the spikelets or longer, slightly thickened upwards. Spikelets few, ovoid, scarcely compressed, green, slightly tinged with violet, 3- to 5-flowered. Glumes about as long as the florets, acute, 3-nerved. Lower pale 3-toothed at the apex, the central tooth sometimes produced into a mucro.

On hilly pastures, heaths, and more rarely in meadows. Rather common, and generally distributed.

England, Scotland, Ireland. Perennial. Summer.

Stems 6 to 21 inches long. Leaves 1 to 6 inches long by $\frac{1}{12}$ to $\frac{1}{8}$ inch broad. Panicle $\frac{3}{4}$ to 2 inches long, with 3 to 15 spikelets. Spikelets $\frac{1}{4}$ to $\frac{3}{8}$ inch long, erect and adpressed to the rachis.

Decumbent Heath-Grass.

French, *Danthorne décombante.* German, *Liegende Sieglingie.*

Wherever this grass occurs it is an indication of great poverty of soil; it is a decided heath and moor grass, and its presence is at once an indication that the whole of the pasturage will be but of little value: so little, indeed, that with many good farmers it is always a question whether lands where it occurs are not better employed in tillage.

GENUS XXVIII.—**KOELERIA.** *Pers.*

Spikelets shortly stalked, laterally compressed, arranged in a subcylindrical spikelike panicle, or in a contracted lobed panicle, with very short lateral branches spreading only at the time of flowering, laterally compressed, open during flowering, each containing 2 to 5 perfect florets. Glumes 2, unequal, both shorter than the florets, keeled, pointed or mucronate, but not awned, scarious, the lower one 1-ribbed and smaller than the upper, which is 3-ribbed. Pales 2, the lower one keeled, entire, and pointed, or bifid and very shortly awned from between the teeth; upper pale bidentate, 2-ribbed. Lodicules 2, oblong, entire, or 2-toothed. Stamens 3. Styles 2, terminal, very short; stigmas plumose, protruded at the sides of the floret, between the basal margins of the pales. Caryops glabrous, free, oblong, laterally compressed, not furrowed.

This genus of grass was named in honour of a German botanist, G. F. Köler.

SPECIES I.—**KOELERIA CRISTATA.** *Pers.*

Plate MDCCXLVI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. XCIII. Fig. 174.
Billot, Fl. Gall. et Germ. Exsicc. No. 1365.
Aira cristata, *Linn.* *Sm.* Engl. Bot. ed. i. No. 648; and Engl. Fl. Vol. I. p. 101.
Poa cristata, *Wild.* *D.C.* Fl. Fr. Vol. III. p. 65.
Festuca cristata, *Poll.* Fl. Veron. Vol. I. p. 121.
Airochloa cristata, *Link*; *Lindl.* Syn. Br. Fl. p. 307. *Parnell*, Grasses of Great Britain, p. 44.

Perennial. Rootstock cæspitose, many-headed, producing numerous flowering stems and barren shoots. Stems erect from a slightly curved base, pubescent or puberulent, leafy nearly to the middle. Leaves narrowly linear, flat or involute, with several thick continuous cartilaginous ribs, generally pubescent; sheaths more or less pubescent, not filamentous at the edges; ligule very short, truncate. Panicle pyramidal-oblong or subcylindrical, more or less lobed, its short branches spreading during the time of flowering, but adpressed both before and afterwards. Spikelets 2- to 4-flowered. Glumes acuminate, pubescent or scabrous, or glabrous and scabrous on the keel only, shining. Lower pale acuminate or acute, entire, not awned.

Var. α, *vulgaris.*

K. cristata, *Bor.* Fl. du Centre de la Fr. ed. iii. Vol. II. p. 717.

Leaves flat or slightly channelled. Panicle oblong-pyramidal, greatly lobed. Glumes usually pubescent or scabrous all over.

Var. β, *gracilis.*

K. gracilis, *Bor.* Fl. du Centre de la Fr. ed. iii. Vol. II. p. 718.

Leaves narrow, generally involute. Panicle subcylindrical, attenuated at the base and apex, slightly lobed. Glumes smooth and shining, with only the keel scabrous.

Var. γ, *albescens.*

K. albescens, *D.C.* *Gren.* & *Godr.* Fl. de Fr. Vol. III. p. 526. *Bor.* Fl. du Centre de la Fr. ed. iii. Vol. II. p. 718.
K. arenaria, *Dumort.* Agrost. Belg. p. 115.

Leaves narrow, involute. Panicle slender, cylindrical, lobed and frequently interrupted towards the base. Glumes glabrous and shining, scabrous on the keel. Lower pale less acuminate than in vars. α and β.

Var. α rather common, and generally distributed, extending north to Sutherland and Ross. Var. β on downs and chalky banks, apparently confined to England, from whence I have specimens from Somerset, Kent, and Cambridge. Var. γ in sandy places by the sea: Quenvais, Jersey, Mr. H. C. Watson; it should be looked for on the southern and western shores of England. Not unfrequent, and generally distributed in Ireland; but I have no means of knowing which of the varieties occur in that island.

England, Scotland, Ireland. Perennial. Summer.

Stems 3 to 18 inches high, or even more in var. α, in which case it is probably the K. pyramidalis of Rochel. Leaves green, slightly glaucous above, 2 inches to 1 foot long, by $\frac{1}{8}$ inch broad or more in var. α, and considerably less in vars. β and γ; the uppermost stem-leaf $\frac{1}{2}$ to $1\frac{1}{2}$ inch long, flat. Panicle 1 to 3 inches long. Spikelets about $\frac{1}{5}$ inch long, silvery, tinged with green, and, more rarely, also with dull purple.

Crested Hair-Grass.

French, *Koelérie à Crête.* German, *Kammförmige Kölerie.*

This grass is found in pastures of dry soil, especially near the sea, and it occurs on rocks of an elevation of 1,500 feet above the sea.

GENUS XXIX.—**MOLINIA.** *Schrank.*

Spikelets stalked, arranged in a compact or lax panicle with short or elongate lateral branches, laterally compressed, open during flowering, each containing 1 to 4 perfect florets, with a subulate rudimentary one above them. Glumes 2, unequal, both shorter than the floret, subacute or subobtuse, but not awned, 1- (rarely 3-) ribbed, scarious, or subherbaceous with scarious margins. Pales 2, the lower one rounded or faintly keeled on the back, entire or dentate, not awned or shortly awned, rather strongly ribbed, parchmentlike; upper pale obtuse or bifid, 2-keeled. Lodicules 2, entire. Stamens 3. Styles 2, terminal, very short; stigmas hairy, protruded at the sides of the flower between the basal margins of the pales. Caryops free, glabrous, oblong or fusiform, furrowed on the inner face.

This genus of grasses was named in honour of G. J. Molina, an Italian botanist.

SPECIES I.—MOLINIA CÆRULEA. *Mönch.*

PLATE MDCCXLVII.

Billot, Fl. Gall. et Germ. Exsicc. No. 94.
Melica cærulea, *Linn.* Mant. *Sm.* Engl. Bot. ed. i. No. 750; and Engl. Fl. Vol. I. p. 113.
Enodium cæruleum, *Gaud.* *Fries*, Summ. Veg. Scand. p. 77.
Aira cærulea, *Linn.* Spec. Pl. p. 95.
Festuca cærulea, *D.C.* Fl. Fr. Vol. III. p. 46. *Bor.* Fl. du Centre de la Fr. ed. iii. Vol. II. p. 716.

Flowering and barren stems fasciculate, the former with the uppermost knot near the base of the stem, without leafless scales at the base. Leaves elongate, erect or ascending, not spreading. Ligule formed of a ring of hairs. Panicle-branches erect or ascending, short or elongate. Glumes 1-ribbed. Lower pale rounded on the back, entire, acuminate, but not awned, with 3 slightly prominent ribs; upper pale obtuse.

Var. *α*, *genuina*.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CL. Fig. 372.
M. cærulea, *Host*; *Reich.* Ic. l. c. p. 47.
Enodium cæruleum, *Dumort.* Agrost. Belg. p. 108.

Apex of stem leaves rarely reaching the base of the panicle. Panicle narrow, compact, with short lateral branches. Spikelets usually wholly dull purplish-blue, rarely green, with the pales edged with purple.

Var. *β*, *major*. Roth.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CL. Fig. 373.
M. littoralis, *Host*; *Reich.* Ic. l. c. p. 47.
M. altissima, *Link*; Hort. Berol. Vol. I. p. 196.
M. arundinacea, *Schrank*, Baier. Fl. p. 36.
M depauperata, *Lindl.* Syn. Brit. Fl. p. 307. *Parn.* Grasses of Britain, p. 45.
Enodium atro-virens, *Dumort*, Agrost. Belg. p. 108.

Apex of upper stem leaves reaching the base of the panicle, or sometimes even exceeding the whole panicle. Panicle long, lax, with long lateral branches. Spikelets green, with the glumes and pales narrowly (rarely broadly) edged with purple, and usually with fewer florets than in var. α.

On heaths and in moist woods. Rather common, and generally distributed. Var. β in marshy woods, by the sides of streams, and on mountains.

England, Scotland, Ireland. Perennial. Summer, Autumn.

Plant growing in dense circular tussocks, composed of closely placed tufts, the base of each of which is enlarged and somewhat bulbous and white. Var. α has the stems 6 inches to 2 feet high, destitute of knots, except close to the base, where there is a single one. Radical leaves none. Leaves few, sheathing the flowering stem about as far as the middle, the lower one short, the longest from 2 inches to 1 foot long by $\frac{1}{6}$ to $\frac{4}{6}$ inch broad, tapering towards the base and apex, very acute, flat, rather stiff, with slender slightly rough closely placed ribs, every third, fourth, or fifth of which is stronger than the others, glabrous or sparingly hairy above, dull bluish-green; sheaths shorter than the leaves, smooth, often tinged with purple; ligule rudimentary, with a few short hairs. Panicle 2 to 10 inches long, narrow. Spikelets $\frac{1}{6}$ to $\frac{1}{4}$ inch long, dull purple, sometimes tinged with green, 2- or 3-flowered; the uppermost floret rudimentary minute. Anthers and stigmas purple.

Var. β has the stem 1 to 3 feet high or more. Leaves 6 to 18 inches long. Panicle 4 to 18 inches long, with the branches much longer, and the spikelets more distant than in var. α, green, with the glumes and pales edged with purple. When the spikelets of var. β have but a single floret, the plant is the M. depauperata of Lindley, which is but a starved state of the lax-panicled form of M. cærulea. It is indeed said that M. depauperata has the pale 5-ribbed instead of 3-ribbed, but this is certainly not always the case, and it was probably an accidental circumstance in Mr. Monro's original Clova specimens of M. depauperata.

Purple Melic-Grass.

French, *Molinie bleue.* German, *Blaue Molinie.*

This grass is of comparatively no agricultural value, and cattle seldom eat it. Wherever found in the meadow it is an indication of want of drainage. This and the *Scabiosa succisa* will usually be found in company. The long slender nodeless stems are to be seen at some of the London tobacconists, where it is sold in small bundles under the name of "Indian Grass," for the purpose of cleaning the short pipe-stem.

GENUS XXX.—**MELICA.** *Linn.*

Spikelets stalked, arranged in a nearly simple unilaterally racemose panicle or in a loose open panicle, slightly laterally compressed, open during flowering, each containing 1 to 3 perfect florets, with a clavate rudimentary one above them. Glumes 2, slightly unequal, as long as or a little shorter than the florets, concave, not awned, 3- to 7-ribbed, scarious. Pales 2, the lower one rounded on the back, entire, not awned, strongly ribbed, parchmentlike; upper pale 2-toothed, 2-ribbed. Lodicules 2, entire. Stamens 3. Styles 2, terminal, very short; stigmas plumose, protruded at the sides of the flower between the basal margins of the pales. Caryops free, glabrous, elliptical, flattened and furrowed on the inner face.

The name of this genus of grasses is derived from the word *Mel*, honey, on account of the sweetness of its stem.

SPECIES I.—**MELICA NUTANS.** *Linn.*

PLATE MDCCXLVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXVII. Fig. 437.
Billot, Fl. Gall. et Germ. Exsicc. No. 2974.
M. Montana, *Huds.* *D.C.* Fl. Fr. Vol. III. p. 31.

Rootstock slender, scarcely cæspitose, shortly creeping, stoloniferous. Stems slender, erect, the flowering ones slightly arching towards the apex. Leaves linear, tapering towards each end, flat, with numerous very slender ribs, slightly pubescent above, bright green; sheaths slightly pubescent-scabrous, the lowest with undeveloped laminæ, split at the very apex only, the uppermost one about as long as its leaf; ligule very short, truncate, without appendages. Panicle drooping, linear, nearly simple, racemose, rather lax, secund. Panicle-branches finely pubescent, all simple and arching-spreading, or the lower ones, with 2 to 4 racemed spikelets and applied to the rachis. Pedicels mostly shorter than the spikelets, ultimately obovate-ovoid, with 2 to 3 fertile florets, and a terminal neuter floret. Glumes a little shorter than the spikelet, oval, obtuse, maroon-red, with pale scarious edges, the upper one a little longer than the lower. Lower pale oval, subobtuse, with 5 or more very strong ribs, faintly punctate-scabrous, glabrous, straw-coloured, often more or less suffused with purple.

In woods, and on shady banks, and ledges of rocks. Rather scarce, extending from Hereford, Stafford, Derby, and York north to Aberdeen, Ross, and Argyle.

England, Scotland. Perennial. Summer.

Stems 1 to 2½ feet high, curved or bent and dull purplish at the base. Radical leaves none. Longest leaves on the flowering stems 2 to 6 inches, on the barren stems 3 to 8 inches, $\frac{1}{6}$ to $\frac{1}{4}$ inch broad. Panicle slightly drooping, 1 to 5 inches long, the lowest branches $\frac{1}{4}$ to

2 inches long. Spikelets $\frac{1}{4}$ to $\frac{3}{5}$ inch long. Lowest floret about $\frac{1}{4}$ inch long. Pale of the neuter flower obovate, turbinate, obliquely truncate, and with the edges inflexed.

Nodding Melic-Grass.

French, *Mélique penchée.* German, *Nickendes Perlgras.*

From the early growth of this grass, and its thriving well in open situations when cultivated, it is worthy of agricultural notice.

SPECIES II.—**MELICA UNIFLORA.** *Retz.*

PLATE MDCCXLIX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXVII. Fig. 436.
Billot, Fl. Gall. et Germ. Exsicc. No. 1594.

Rootstock slender, scarcely cæspitose, creeping, stoloniferous. Stems slender, erect. Leaves linear, tapering towards each end, flat, with numerous slender ribs, slightly pubescent above, bright green; sheaths pubescent, entire, the uppermost one shorter than its leaf, all with laminæ; ligule nearly absent, but with a long subulate pubescent process at the top of the sheath, on the side of the stem opposite the lamina. Panicle erect, pyramidal, slightly compound, very lax, equal. Panicle-branches finely scabrous, most of them branched at the apex, simple, spreading-ascending. Pedicels mostly longer than the spikelets. Spikelets ultimately obovate-oblong, with 1 perfect floret and a terminal neuter floret. Glumes as long as or a little longer than the spikelet, oval-oblong, abruptly acuminate, maroon-red, with pale edges, the upper one conspicuously larger than the lower. Lower pale oval, subobtuse, with 1 or 3 rather strong ribs, smooth or nearly so, glabrous, straw-coloured.

In woods and on shady hedgebanks. Rather frequent, and generally distributed in England and the south of Scotland, but rather rare north of the Forth and Clyde, though said to extend to Kincardine and Moray. Widely distributed over Ireland.

England, Scotland, Ireland. Perennial. Summer.

Stems 1 to 2 feet high. Longest leaves 4 to 8 inches long, by $\frac{1}{7}$ to $\frac{3}{8}$ inch broad. Panicle 3 to 8 inches long; lowest panicle-branches 1 to 3 inches long. Spikelets $\frac{1}{6}$ to $\frac{1}{4}$ inch long. Lowest floret about $\frac{1}{6}$ inch long. Pale of the neuter floret as in M. nutans.

Very like M. nutans, but even when not in flower the remarkable process proceeding from the ligule, but on the opposite side of the stem, distinguishes it from that plant. Besides this, the very lax open panicle with the florets not secund, and the lower branches spreading widely and bare of florets at the base, also the smaller spikelets with longer more acuminate glumes, and only a single fertile floret, are more conspicuous characters.

Wood Melic-Grass.

French, *Mélique uniflore.* German, *Einblüthiges Perlgras.*

The most natural place of growth of this grass is in rocky moist shady woods, having a clayey soil, situated about 300 feet above the sea. It has not been found in America, or further north than a latitude of 62°. Its limit of altitude seems to be about 1,500 feet above the sea.

GENUS XXXI.—**CATABROSA.** *Pal. de Beauv.*

Spikelets stalked, arranged in a loose open panicle, subcylindrical or slightly laterally compressed and biconvex, open during flowering, each containing 2, or, more rarely, 1 or 3, perfect florets, of which the lowest is sessile and the uppermost stalked, sometimes with 1 or 2 stalk-like rudimentary ones above the perfect florets or floret. Glumes 2, unequal, both shorter than the floret, concave, not awned, 1- or imperfectly 3-ribbed, scarious. Pales 2; the lower one concave, keeled, rounded or truncate and erose-denticulated at the apex, not awned, 3- to 7-ribbed, with the ribs not extending to the apex, parchment-like, with a broad scarious apex; upper pale lanceolate, truncate or emarginate, 2-ribbed. Lodicules 2, lanceolate. Stamens 3. Styles 2, very short, terminal; stigmas plumose, protruded at the sides of the flower between the basal margins of the pales. Caryops free, glabrous, obovate, laterally compressed, not furrowed.

The name of this genus of plants is derived from the Greek word, *κατάβρωσις*, an eating out.

SPECIES I.—**CATABROSA AQUATICA.** *Pal. de Beauv.*

PLATE MDCCL.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CL. Fig. 374.
Billot, Fl. Gall. et Germ. Exsicc. No. 2175.
Aira aquatica, *Linn.* *Sm.* Eng. Bot. ed. i. No. 1557. & Eng. Fl. Vol. I. p. 101.
Glyceria aquatica, *Presl*; *Koch,* Syn. Fl. Germ. et Helv. ed. ii. p. 933. (non *Wahl.*)
G. airoides, *Reich.* Fl. Germ. Exsicc. Vol. I. p. 45.
Poa airoides, *Köl.* D.C. Fl. Fr. Vol. III. p. 64.

Stems creeping and rooting at the base. Leaves flaccid, broadly linear, obtuse, flat; ligule oblong-triangular, rounded at the apex. Panicle very lax, pyramidal, diffuse. Spikelets 2- rarely 1- 3- or 4-flowered, olive, usually stained with purple. Lower pale with 3 very prominent glabrous ribs.

In ditches, by the margins of pools and ponds, and on wet sand; rather scarce but distributed over the whole island, reaching to Orkney and Shetland. Widely distributed throughout Ireland.

England, Scotland, Ireland. Perennial. Summer.

Stems extensively creeping and rooting, producing long leafy barren branches which are often floating and sometimes attain the length of 2 or 3 feet. Flowering stems 3 inches to 2 feet high, erect or ascending, leafy up to the panicle. Longest leaves 1 to 9 inches long by $\frac{1}{4}$ to $\frac{3}{4}$ of an inch broad, thin, slightly glaucous, the lower ones often producing barren shoots from their axils. Panicle 1 to 10 inches long, with numerous spreading branches $\frac{1}{2}$ to 3 inches long, arranged in half-whorls, with the branches in each whorl unequal and distantly branched. Spikelets $\frac{1}{12}$ to $\frac{1}{6}$ inch long, not contiguous. Glumes unequal, much shorter than the spikelets, truncate, erose-denticulate, often violet, the outer one much the smaller and without ribs, the upper one broadly obovate and 3-ribbed at the base. Outer pale truncate, erose and scarious at the apex, with the 3 ribs running into the white scarious part, greenish or yellowish olive, often tinged with dull purple but having the ribs green.

Professor Babington states that though the spikelets are usually 2- they are sometimes 3- to 5-flowered, but I have not seen the plant with more than 3-flowered spikelets.

Sometimes, when growing on wet sand by the sea, the stems are only 2 or 3 inches high and the spikelets are commonly 1-flowered, but it seems impossible to draw a line of demarcation between this and the ordinary form.

Water Whorl-Grass.

French, *Catabrose aquatique.* German, *Wasser-Quellgras.*

This is said to be one of the sweetest of British grasses, the young leaves and portions of the stem being remarkably sweet and pleasant to the taste, resembling that of liquorice. Waterfowl are fond of the seeds and young shoots. Cattle eat the leaves with relish, but as the plant is strictly aquatic, found only in wet places and muddy pools, it is unfit for cultivation.

When it is growing in the ponds and wet swags of some of our rivers it assumes a large and highly conspicuous form, but if from any cause the water recedes for sometime it grows very small and inconspicuous; this is a fact noticed by Hooker as follows: "Mr. Wilson finds in the wet sands of the north shore of Liverpool a variety not two inches high, each calyx containing in general but one perfect flower."

GENUS XXXII.—GLYCERIA. *R. Br.*

Spikelets stalked, rarely subsessile, arranged in a lax panicle which is sometimes racemose, subcylindrical or slightly laterally compressed before flowering, open during flowering, each containing 4 to 20 perfect florets. Glumes persistent, very unequal, the lower one the smaller, both shorter than the florets, not awned, subscarious. Pales 2, the lower one concave, rounded on the back, truncate or obtuse, not awned, with 7 prominent ribs, subherbaceous, more or less scarious at the apex; upper pale bidentate, 2-ribbed, the ribs very finely ciliated. Lodicules 2, truncate. Stamens 3, rarely 2. Styles 2, terminal, short, persistent; stigmas clothed with plumose hairs, protruded at the sides of the flower between the margins of the pales. Caryops free, glabrous, oblong, furrowed on the inner face.

The name of this genus is derived from the Greek word γλυκύς, sweet, in allusion to the saccharine nature of some of the species.

SECTION I.—EU-GLYCERIA. *Ledeb.*

Spikelets very long, cylindrical before flowering, afterwards linear, or oblong-linear, and laterally compressed. Lodicules cohering. Stems weak. Leaves flaccid.

SPECIES I.—**GLYCERIA FLUITANS.** *R. Br.*

PLATES MDCCLII. MDCCLIII.

Poa fluitans, *Scop.* *Hook.* & *Arn.* Brit. Fl. ed. viii. p. 548.
Festuca fluitans, *Linn.* Spec. Plant p. 111.

Perennial. Rootstock subcæspitose, without subterranean stolons. Stems procumbent and rooting at the base, and then ascending or suberect, rather stout, weak. Leaves flaccid, broadly linear, parallel-sided, rounded or abruptly acuminate at the apex, ultimately flat, with numerous very slender ribs, pale glaucous green, often floating; sheaths compressed, ancipitate; ligule prominent, oblong-triangular, subacute, often lacerate. Panicle erect or drooping at the apex, elongate, subsecured, lax, sometimes nearly simple and racemose, sometimes compound. Panicle-branches commonly 2 or 3 or 5 at the lower nodes of the rachis, very unequal, one of those at each of the lower nodes bearing but a single spikelet, the longer ones spreading or even reflexed during flowering, adpressed before and afterwards, or adpressed during flowering and diverging in fruit. Spikelets stalked or subsessile, elongate, nearly cylindrical before flowering, afterwards slightly laterally compressed, 4- to 15-flowered, pale green. Glumes unequal, the upper one the larger but considerably shorter than the lowest floret. Lower pale oblong, obliquely-truncate, scarious and often erose at the apex, with 7 prominent ribs.

[SUB-SPECIES I.—Glyceria eu-fluitans.

PLATE MDCCLII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLII. Fig. 380.
Billot, Fl. Gall. et Germ. Exsicc. No. 483.
G. fluitans, *Fries.* *Bab.* Man. Brit. Bot. ed. vi. p. 415. et *Auct. Plur.*

Sheaths scarcely furrowed or slightly furrowed. Panicle slender, subracemose. Rachis smooth. Panicle-branches 2 or 3 together at the lower nodes of the rachis, spreading in flower, at other times adpressed, or diverging in fruit, 1 of those at each of the lower nodes longer than the others and bearing several racemosely arranged spikelets, but not again branched; the other branch or pair of branches with but a single spikelet. Spikelets linear, acute, with 7 to 15 florets inserted on the axis at distances equal to about twice their breadth. Lower pale (in profile) 5 or 6 times as long as broad, obliquely truncate, subacute, narrowly scarious at the apex. Anthers about 5 times as long as broad. Caryops narrowly eliptical.

Var. *α*, *genuina.*

G. fluitans, *Townsend.* Ann. Nat. Hist. Ser. ii. Vol. V. p. 104.

Sheaths scarcely furrowed. Lower panicle-branches in pairs.

Var. *β*, *pedicellata.*

G. pedicellata, *Towns.* Ann. Nat. Hist. Ser. ii. Vol. V. p. 108.

Sheaths slightly furrowed. Lower panicle-branches mostly in threes. Lower pale and anthers rather shorter in proportion to their breadth than in var. *a*.

In wet places and ditches and by the sides of ponds, often growing actually in the water; common, and generally distributed. Var. β not uncommon.

England, Scotland, Ireland. Perennial. Summer, Autumn.

Stems 1 to 3 feet high, thick, weak, rooting at the base, and then ascending. Leaves 3 inches to 1 foot long, by $\frac{1}{4}$ to $\frac{1}{2}$ inch broad, usually abruptly acute, the upper one shorter than its leaf; ligule $\frac{1}{4}$ inch long. Panicle 6 to 20 inches long, the longest branches not exceeding 4 inches. Spikelets $\frac{1}{2}$ to $1\frac{1}{2}$ inch long, pale green. Florets $\frac{1}{4}$ inch long. Anthers about $\frac{1}{6}$ inch long, yellow or purple.

A careful examination of Mr. Townsend's specimens of his G. pedicellata has convinced me that they ought to be referred to G. eu-fluitans and not to G. plicata, a belief which is confirmed by Mr. Townsend referring to the figure of "Festuca fluitans" in Curtis' Flora Londonensis, fasc. i. tab. 18, as "a good plate" of his G. pedicellata.

Floating Meadow-Grass.

French, *Glycérie aquatique.* German, *Fluthende Schwaden.*

The Floating Meadow-Grasses are very variable. They have all, however, one character in common, namely, that from their situations they are extremely liable to become ergotised; and we have reason to think that the greediness with which cattle eat them, is, when in this state, not without much danger, especially to gravid animals.

In several parts of Germany this grass is cultivated for its seeds, which form the manna croup of the shops, and are considered a delicacy in soups and gruels. Birds it is said are fond of the seeds, which, when pounded into meal, make bread very little inferior to wheaten bread.

SUB-SPECIES II.—**Glyceria plicata.** *Fries.*

PLATE MDCCLIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLIII. Fig. 381.
Billot, Fl. Gall. et Germ. Exsicc. No. 183.
G. fluitans, var. β, *Hook. & Arn.* Brit. Fl. ed. viii. p. 548.

Sheaths sulcate. Panicle rather broad and compound, or slender and subracemose. Rachis scabrous towards the apex. Panicle-branches 2 to 5 at the lower nodes of the rachis, usually adpressed during flowering and diverging in fruit, 1 of those at each of the lower nodes longer than the others, usually greatly so, and bearing several racemosely arranged spikelets, or compound and bearing branches with racemosely arranged spikelets, the other branches with a single spikelet, or (rarely) one of them with 2 or 3 spikelets. Spikelets oblong-linear, obtuse, with 4 to 12 florets inserted on the axis at distances about equal to their breadth. Lower pale (in profile) 3 or 4 times as long as broad, truncateerose, subobtuse, broadly scarious at the apex. Anthers about twice as long as broad. Caryops broadly elliptical.

Var. α, *genuina.*

Panicle greatly compound, with the branches diverging in fruit in threes or fives at the lower nodes. Spikelets all conspicuously stalked.

Var. β, *subspicata.* Parnell.

Panicle simple, or nearly so, with short adpressed branches in pairs at the lower nodes. Lateral and solitary spikelets subsessile.

In ditches, in wet places, apparently rather rare, but doubtless often passed over as G. eu-fluitans. I have no specimens from further north than Cowdenbeath, Fife, though I believe I gathered it near Swanbister, Orkney, but I have preserved no specimens from that locality in my herbarium, and as it was in the year 1849 I cannot now speak with certainty. In Ireland it is recorded from counties Dublin, Galway, and Mayo. The variety β appears to be nearly as common as the type.

England, Scotland, Ireland. Perennial. Summer, Autumn.

Very near G. eu-fluitans, but occasionally attaining a larger size and with the spikelets shorter and thicker than those of G. eu-fluitans—comparing spikelets of each plant which have the same number of florets, but as the number of florets in the spikelet varies in each subspecies, spikelets of G. plicata with numerous florets will be considerably longer than those of G. eu-fluitans with few: in G. plicata, in fact, the length of the spikelets varies from $\frac{1}{4}$ to 1 inch. This comparative shortness arises from the florets being placed closer to each other on the axis of the spikelet of G. plicata. The florets are also shorter, $\frac{1}{8}$ to $\frac{1}{6}$ inch long, the lower pale is broader in proportion to its length, more strongly ribbed, blunter, and more scarious at the apex, which is often shortly 3- to 5-toothed. Anthers only about half as long as in G. eu-fluitans, caryops shorter and broader, and rachis is slightly rough in the upper part.

G. plicata var. α cannot well be mistaken for G. eu-fluitans on account of the compound panicle with much more numerous spikelets, but var. β and transition states between var. α and var. β require minute examination to separate them from G. eu-fluitans.

When growing in dry places G. plicata var. β is densely cæpitose, the stems sometimes not above 3 or 4 inches long, and the panicle reduced to a lax spikelike raceme.

A third subspecies of G. fluitans occurs in the south of Europe; it is the G. spicata of Gassone and closely resembles our G. plicata var. β, but the upper pale in G. spicata is a little longer than the lower, while in the 2 British subspecies it is shorter.

Folded-leaved Meadow-grass.

Section II.—MEGACHLOA. *Gren. & Godr.*

Spikelets rather short, elliptical-ovoid and slightly compressed before flowering, afterwards oblong and greatly laterally compressed. Lodicules free from each other. Stem stout, rigid. Leaves very firm or rigid.

SPECIES II.—**GLYCERIA AQUATICA.** *Sm.*

PLATE MDCCLI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLII. Fig. 379.
Billot, Fl. Gall. et Germ. Exsicc. No. 2176.
G. spectabilis, *Mert. & Koch. Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 932.
Poa aquatica, *Linn. Sm.* Engl. Bot. ed. i. No. 1315. *Hook. & Arn.* Brit. Fl. ed. viii. p. 548.
Hydrochloa aquatica, *Hartm.* Lindl. Syn. Brit. Fl. p. 316.

Perennial. Rootstock extensively creeping, not cæspitose, with long subterranean leafless stolons terminating in leafy barren stems. Stems erect, very stout, rigid. Leaves very stiff, broadly linear, parallel-sided, abruptly-acuminated and hooded and mucronate at the apex, with numerous broad elevated ribs; sheaths compressed, ancipitate; ligule short, truncate, with an elongate central point. Panicle erect, pyramidal, equal, rather lax, very compound. Panicle-branches commonly 5 at the lower nodes of the rachis, somewhat unequal, all of them bearing numerous spikelets, diverging during and after flowering. Spikelets shortly stalked, short, oblong-elliptical and compressed before flowering, afterwards oblong-ovoid and greatly compressed, 4- to 9-flowered, olive. Glumes slightly unequal, the upper one the larger, but considerably shorter than the lowest floret. Lower pale subobtuse, scarcely scarious at the apex, with 7 prominent ribs.

By the edges of ditches and slow rivers and ponds; rather common and generally distributed in England. Rare in Scotland, though extending north to Haddingtonshire, Kincardine, Clackmannan, and Loch of Lindores, Fife. In Aberdeenshire it is merely naturalised, according to Dr. Dickie's Botanist's Guide. It is also reported from Forfar and Moray; but those counties are so much to the north of its ascertained limits that some proof may be required that it has not been planted. A single root from Surrey, planted 3 years ago in the bed of an old pond in Balmuto Garden, through which runs a small stream, has now extended until the plant occupies an area of about 30 square yards; so that it is evident if the plant is once introduced it will soon have the appearance of being a native. Very local in Ireland, and occurring principally in the centre and east of that island.

England, Scotland, Ireland. Perennial. Late Summer, Autumn.

Flowering stems 2 to 6 feet high, barren stems shorter. Leaves only on the flowering and barren stems, 8 inches to 2 feet long by $\frac{1}{4}$ to $\frac{3}{4}$ inch broad, at first folded, ultimately nearly flat; sheaths with a pale ring at the apex, broadest towards the split side. Panicle

4 to 14 inches long by 2 to 6 inches broad, with very numerous spikelets. Florets $\frac{1}{8}$ inch long, rarely viviparous. Anthers yellow.

Reed Meadow-Grass.

French, ***Glycérie flottante.*** **German,** ***Wasser Schwaden.***

This is a true aquatic species of grass, usually growing in water, either of ponds or rivers. Its panicles of neatly formed awnless locustæ of flowers are very imposing, and its foliage is at all times broad and conspicuous, so that this grass is a fine covert for waterfowl. On cultivating this grass in plots of land out ot the water curious results were arrived at, which suggest the propriety of continuing to repeat the experiments. It is one of the few aquatic species which will live out of water, though it is even then too harsh to be of any value.

The leaves of this grass are particularly liable to attacks of *Uredo longissima*, Sow., Elongated Uredo, which occurs in long olive-brown slits beneath the epidermis of the leaves.

GENUS XXXIII.—**SCLEROCHLOA.** *Pal. de Beauv. Bab.*

Spikelets (excepting the terminal ones) subsessile or very shortly stalked, arranged in a lax or dense panicle, which is usually more or less distichously unilateral and sometimes reduced to a spikelike raceme, slightly laterally compressed before flowering, open during flowering, each containing 3 to 11 perfect florets. Glumes persistent, unequal or nearly equal, both shorter than the florets, not awned, subscarious. Pales 2, the lower one concave, rounded on the back, at least towards the base, but often keeled towards the apex, not awned, with 5 (rarely 3) rather faint ribs, parchment-like, more or less scarious at the apex, which is obtuse or shortly mucronate; upper pale bidentate, 2-ribbed, the ribs usually strongly setose-ciliate. Lodicules 2, acute or bilobed. Stamens 3. Styles 2, terminal, very short, caducous; stigmas clothed with simple hairs, protruded at the sides of the floret between the margins of the pales. Caryops free, glabrous, narrowly oblong, or linear, usually not distinctly furrowed on the inner face.

Name from σκληρος (scleros) *hard*, and χλοη (chloe) *grass*.

SECTION I.—HELEOCHLOA. *Fries.*

Rachis and panicle-branches subcylindrical or bluntly triangular. Spikelets subcylindrical, very slightly laterally compressed before flowering. Glumes very unequal, the lower one minute, 1- to 3-ribbed, the upper larger and 3-ribbed. Lower pale 5-ribbed, rounded on the back, indistinctly keeled towards the apex only. Caryops oblong-linear, not furrowed on its face.

SPECIES I.—**SCLEROCHLOA MARITIMA.** *Lindl.* (non *Reich.*)

PLATE MDCCLIV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLI. Fig. 377.

Glyceria maritima, *Wahl.* *Sm.* Engl. Fl. Vol. I. p. 118. *Hook*, Stud. Fl. p. 445. *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 933. *Fries*, Summ. Veg. Scand. p. 77. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 535. *Crep.* Man. Fl. Belg. ed. ii. p. 347, & Not. Fasc. v. pp. 209 & 246. *Reich.* Ic. l. c. p. 48.

Puccinellia maritima, *Parl.* Fl. Ital. Vol. I. p. 570.

Poa maritima, *Huds.* *Sm.* Eng. Bot. ed. i. No. 1140. *Hook.* & *Arn.* Brit. Fl. ed. viii. p. 549.

Festuca thalassica, *Kunth*, Enum. Plant. Vol. I. p. 394.

Rootstock densely cæspitose, producing very numerous elongate decumbent or prostrate leafy barren stems or shoots, which sometimes root at the nodes, and a few flowering stems. Flowering stems ascending or erect usually from a curved or geniculate base, rather rigid. Leaves of the barren stems distichously spreading, thick and fleshy, folded so as to appear subcylindrical with a groove on the upper surface. Stem leaves thinner, channelled, or in luxuriant specimens nearly flat with a few very thick prominent cartilaginous ribs; sheaths smooth, the uppermost one longer than its leaf; ligule short, truncate. Panicle unilaterally distichous. Rachis with distant nodes. Panicle-branches rather slender, rigid, 2 or 3 at each of the lower nodes of the rachis, unequal, the longer ones unbranched and bare of florets at the base for nearly half their length, simple or once- (very rarely twice-) branched, spreading in flower, adpressed or, rarely, reflexed in fruit. Spikelets usually few, unilaterally and racemosely disposed on and adpressed to the branches of the panicle; the lateral spikelets on short thick pedicels which are dilated upwards and usually about as long as the lower glume, 3- to 8-flowered, at first compressed subcylindrical, afterwards oblong-elliptical and greatly compressed. Glumes unequal, both 3-ribbed, or the lower one sometimes 1-ribbed. Lower pale narrowly or, rarely, broadly scarious at the apex, subacute or obtuse, not mucronate, 5-ribbed, the midrib falling short of or reaching the apex, but not excurrent. Anthers linear-oblong.

Var. α, *genuina*.

Panicle-branches adpressed in fruit.

Var. β, *deflexa.*

Panicle-branches deflexed or reflexed in fruit.

In salt marshes and on moist shores of the sea and tidal rivers; common, and generally distributed. Var. β Rhyl, Flint, Mr. J. Whittaker; "at the farthest extremity of the St. Helen's Spit," Isle of Wight, Dr. Bromfield in "Flora Vectensis."

England, Scotland, Ireland. Perennial. Summer.

Plant growing in dense tufts, with very numerous trailing and sometimes rooting barren shoots, from a few inches to 1 foot or more long, with numerous spreading distichous leaves 1 to 4 inches long. These leaves appear rush-like, but are really folded together. Flowering stems 6 inches to 2 feet high. Panicle 2 to 6 inches long; the longest branches 1 to 2½ inches. Spikelets ¼ to ½ inch long, according to the number of florets, pale green, often tinged with purple, especially on one side. Florets ⅛ to ⅕ inch long.

Creeping Sea Meadow-Grass.

SPECIES II.—SCLEROCHLOA MULTICULMIS.

PLATES MDCCLV. MDCCLVI.

Glyceria distans, *Hook fil.* Stud. Fl. p. 446.

Rootstock cæspitose, producing a few short ascending or erect leafy barren shoots, which do not root at the nodes, and very numerous flowering stems. Flowering stems erect or ascending, sometimes from a curved or geniculate base. Leaves of the barren shoots ascending or erect, rather thick but not at all fleshy, flat, more or less hooded at the apex, with numerous thick prominent cartilaginous ribs. Stem leaves similar to those of the barren shoots; sheaths smooth, the upper one longer than its leaf; ligule short, deltoid or truncate. Panicle nearly equal or more or less distichously unilateral, lax, or rather lax, triangular-oblong or rhomboidal-oblong in outline. Rachis with distant nodes. Panicle-branches weak or rather rigid, varying in number from 2 to 6 at each of the lower nodes of the rachis, unequal, the longer ones bare of spikelets, and unbranched at the base from one-half to one-eighth of their length, usually once- or twice-branched, erect or ascending in flower, ascending or spreading-ascending in fruit. Spikelets numerous, distichously and spicato-racemosely, or unilaterally-distichously and subspicately disposed on and adpressed to the branches of the panicle, the lateral ones subsessile, all 2- to 8-flowered, at first subcylindrical, afterwards oblong and subcompressed. Lower glume faintly 1-ribbed, the upper one 3-ribbed. Lower pale more or less broadly scarious at the apex, obtuse or acute, sometimes mucronate, faintly or rather strongly 5-ribbed, with the midrib falling short of the apex or excurrent. Anthers oblong.

SUB-SPECIES I.—**Sclerochloa distans.** *Bab.*

PLATE MDCCLV.

Reich, Ic. Fl. Germ. et Helv. Vol. I. Tab. CLI. Figs. 375 & 376.

Billot, Fl. Gall. et Germ. Exsicc. No. 184.

Glyceria distans, *Sm.* Engl. Fl. Vol. I. p. 118. *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 932. *Fries*, Mant. ii. p. 10, & Summ. Veg. Scand. p. 77. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 556. *Crep.* Man. Fl. Belg. ed. ii. p. 347, & Not. Fasc. 5, pp. 209 & 226. *Reich.* Ic. l.c. p. 47.

Puccinellia distans, *Parl.* Fl. Ital. Vol. I. p. 367.

Poa distans, *Linn.* *Sm.* Engl. Bot. ed. i. No. 986. *Hook. & Arn.* Brit. Fl. ed. viii. p. 549. *Lindl.* Syn. Brit. Fl. p. 318.

Festuca distans, *Kunth*, Enum. Plant. Vol. I. p. 393.

Flowering stems rather weak. Leaves gradually hooded at the apex. Panicle nearly equal, lax, triangular or oblong in outline. Panicle-branches very slender or capillary, weak, from 3 to 6 at the lower nodes of the rachis, but generally 5, unequal, the longer ones unbranched and bare of spikelets at the base for nearly half their length, ascending- spreading in flower, reflexed in fruit. Spikelets distichously and spicato-racemosely disposed on the branches of the panicle ; the lateral ones on extremely short thick pedicels, which are slightly dilated upwards and usually about as long as the lower glume; all 3- to 8-flowered, usually 5- or 6-flowered, at first compressed subcylindrical, afterwards oblong-elliptical and much compressed. Lower pale broadly scarious at the apex, obtuse, not mucronate, very faintly 5-ribbed, with the midrib falling short of the apex. Anthers oblong.

Var. α, *genuina.*

Ligule deltoid, subacute. Lower pale obliquely truncate, and so forming an obtuse angle at the apex.

Var. β, *obtusa.* Parn.

Ligule transversely truncate. Lower pale transversely truncate, and rounded at the apex.

In salt marshes, waste places, especially such as are overflowed in winter by the sea and tidal rivers. Common, and generally distributed.

Rare inland. Var. β in the west of England: Bideford, Devon; Beadley Bay, Gloucester; Breedon, Leicestershire; and near Dublin.

England, Scotland, Ireland. Biennial or perennial (?). Summer, Autumn.

Stems 3 inches to 2 feet high. Leaves with the barren shoots 1 to 6 inches long by $\frac{1}{10}$ to $\frac{1}{5}$ inch broad, slightly glaucous. Stem leaves short, the uppermost one $\frac{1}{2}$ to 3 inches long. Panicle 2 to 10 inches long, pyramidal. Spikelets $\frac{1}{6}$ to $\frac{1}{3}$ inch long, often tinged with purple, but sometimes wholly green. Florets $\frac{1}{12}$ to $\frac{1}{8}$ inch long.

The var. β is scarcely deserving of separation from the type.

S. distans bears considerable resemblance to S. maritima, but the barren shoots are not prostrate, and the leaves on them are not spreading, not fleshy, nor conduplicate; the flowering stems are more numerous, weaker; the panicle is nearly equal, not unilateral; the panicle-branches more numerous, more slender, and more of them bare of spikelets at the base; the pedicels are considerably shorter; the glumes smaller, and the lower one with rarely more than 1 rib; the spikelets smaller and much more numerous; the lower pale shorter, blunter, and more obtuse; and the anthers shorter than in S. maritima.

Reflexed Meadow-Grass.

French, *Glycérie écartée.* **German,** *Abstehender Schwingel.*

SUB-SPECIES II.—Sclerochloa Borreri. *Bab.*

PLATE MDCCLVI.

Billot, Fl. Gall. et Germ. Exsicc. No. 2177.

Glyceria Borreri, *Bab.* Eng. Bot. Suppl. No. 2797. *Hook. fil.* Stud. Fl. *Crep*, Man. Fl. Belg. p. 347, and note fasc. 5, pp. 208 & 241.

G. conferta, *Fries. Hook. fil.* Stud. Fl. p. 446. *Fries*, Mant. ii. p. 10, & Summ. Veg. Scand. p. 77. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 536.

Poa Borreri, *Hook. & Arn.* Brit. Fl. ed. viii. p. 549.

Flowering stems rather firm. Leaves abruptly hooded at the apex. Panicle nearly equal in the lower half, and unilaterally distichous in the upper, or wholly unilaterally distichous, ultimately rather lax and rhomboidal-oblong, or subtriangular-oblong in outline. Panicle-branches rather rigid, usually 2, but sometimes 3, 4, or 5; the lower nodes of the rachis, unequal, the longer ones unbranched and bare of spikelets at the base for from one-eighth to one-third of their length, erect—ascending in flower, ascending or spreading-ascending in fruit. Spikelets unilaterally, distichously, and subspicately disposed on the branches of the panicle; the lateral ones subsessile; all 2- to 7-flowered, but usually 3- or 4-flowered, at first compressed subcylindrical, afterwards oblong and much compressed. Lower pale narrowly scarious at the apex, subacute, mucronate, 5-ribbed, with three of the ribs prominent and the midrib reaching the apex and extending beyond it forming a mucro. Anthers quadrate-oblong.

In salt marshes and waste places by the sea and tidal rivers, local. Confined to the south and east coast of England, from Sussex to Suffolk, or perhaps York. Frequent along the estuary of the Thames, especially on the Kentish shore. I have seen no specimens from any stations north of Walton-on-the-Naze, Essex, where I have gathered it plentifully, but the Rev. W. W. Newbould has found it at Lowestoft, Suffolk. In Ireland it occurs at North Lots, near the mouth of the Liffey; at Sandy Mount, and along Dublin Bay.

England, Ireland. Biennial or perennial. Summer, Autumn.

Stems 6 to 18 inches high. Leaves 2 to 10 inches long by $\frac{1}{8}$ to $\frac{1}{6}$ inch broad, boat-shaped at the extremity, slightly glaucous. Panicle 1 to 6 inches long. Spikelets green, $\frac{1}{8}$ to $\frac{1}{5}$ inch long, rarely faintly tinged with purple. Florets $\frac{1}{12}$ inch long.

Very similar to S. distans, indeed intermediate between it and S. procumbens, but a more robust plant than S. distans; the leaves usually broader, more abruptly acute and more boat-shaped at the apex; the panicle much less lax, more or less one-sided, at least above the first whorl of branches; panicle-branches stiffer, shorter, and bare of florets at the base for a much shorter distance than in S. distans, never reflexed; spikelets smaller, usually fewer flowered and more fasciculate than in S. distans, wholly green, unilaterally arranged on the branches of the panicle, and attached to pedicels which are scarcely longer than wide. Lower pale more acute and with a narrow scarious margin, and with the ribs stronger than in S. distans, the midrib always excurrent, and forming a slight mucro.

The panicle of S. Borreri when looked at from above can be included within a lozenge, the lowest whorl of branches pointing in a direction different from any of the others. If these lowest branches are removed, the remaining part of the panicle may be usually inscribed in a triangle, and sometimes, when the panicle is short, the whole of it may be inscribed in a triangle; but this is by no means generally the case, as Mons. Crepin supposes, in his elaborate Monograph, published in the fifth fasciculus of his "Notes." I have before me at present cultivated specimens, raised from the seed of the Essex plant, in which it is quite impossible to find any one side to which the branches of the panicle do not point, and I have observed the same in wild Kentish and Essex specimens. This being so, I have no doubt whatever that Glyceria Pseudo-distans (Crepin) cannot be separated from S. Borreri as a distinct species.

It is with much hesitation that I conjoin S. distans and S. Borreri as subspecies, and have thought it best to give a new name to the aggregate under which I have included them.

Borrer's Meadow-Grass.

SPECIES III.—SCLEROCHLOA PROCUMBENS. *Pal. de Beauv.*

PLATE MDCCLVII.

Billot, Fl. Gall. et Germ. Exsicc. No. 2587.

Glyceria procumbens, *Sm.* Brit. Fl. Vol. I. p. 119. *Hook. fil.* Stud. Fl. p. 446. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 537. *Crep*, Man. Fl. Belg. ed. ii. p. 347, & note fasc. 5, p. 208.

Scleropoa procumbens, *Parl.* Fl. Ital. Vol. I. p. 474.

Poa procumbens, *Curt.* *Sm.* Engl. Bot. ed. i. No. 532. *Hook. & Arn.* Brit. Fl. ed. viii. p. 550.

Festuca procumbens, *Kunth*, Enum. Plant. Vol. I. p. 393.

Rootstock cæspitose, producing a few short ascending leafy barren shoots which do not root at the nodes, and very numerous flowering stems. Flowering stems rather stout, weak, ascending or decumbent or procumbent, sometimes from a curved or geniculate base. Leaves of the barren shoots ascending or erect, linear, rather thick, but not at all fleshy, flat, deeply hooded at the apex, with numerous thick prominent cartilaginous ribs. Stem leaves similar to those of the barren shoots; sheaths smooth, the upper one longer than its leaf; ligule elongate, narrowly triangular, acute. Panicle distichously unilateral, dense, ovate- or lanceolate-oblong. Rachis with approximate nodes, trigonous. Panicle-branches rigid, 2 or 3 at each of the lower nodes of the rachis, the longer ones bare of spikelets and unbranched at the base for from one-third to one-eighth of their length, once- or thrice-branched, erect-ascending in flower, spreading-ascending or spreading in fruit. Spikelets numerous, unilaterally, distichously, and spicately disposed on and diverging from the branches of the panicle; the lateral ones sessile; all 3- to 6-flowered, but usually 5-flowered. Lower glume 1-ribbed, the upper one 3-ribbed. Lower pale rather broadly scarious at the apex, subobtuse, sometimes faintly mucronate, rather strongly 5-ribbed, with the ribs prominent towards the apex, and the midrib reaching the apex or sometimes slightly excurrent and forming a minute mucro. Anthers quadrate-oblong.

On waste ground and by the sides of roads near the sea and tidal rivers. Common in the south and east of England, rare in the north, though extending to the counties of Lancaster and Northumberland; but though it grows as far north as the Ferne Islands, I am not aware of any well authenticated Scotch station, though it is said to occur in Forfarshire. Widely distributed in the south and east of Ireland.

England, Ireland. Biennial or perennial (?). Summer, Autumn.

Stems 3 to 18 inches high, rather thick but weak, sometimes in dry places quite prostrate. Leaves 2 to 7 inches long by $\frac{1}{8}$ to $\frac{1}{4}$ inch broad. Panicle 1 to 3 inches long, the branches in the middle as long as those at the base. Spikelets $\frac{1}{6}$ to $\frac{1}{4}$ inch long. Florets $\frac{1}{8}$ inch long.

Distinguished from S. Borreri by its more compact and more perfectly unilateral panicle, with the lower branches much shorter in proportion to the middle ones, by its longer spikelets and florets, by its lower pale being more strongly ribbed towards the apex in fruit, and with its midrib either not excurrent or forming only a very minute mucro. The leaves also are broader, and the ligule much longer and more acute.

S. distans, S. Borreri, and S. procumbens, are all perennant: generally the plant dies after once flowering, but sometimes the root remains alive, and throws up flowering stems the second year.

Procumbent Meadow-Grass.

German, *Niederliegender Schwingel.*

SECTION II.—SCLEROPOA. *Griesb.*

Rachis and panicle-branches ancipitate-triquetrous. Spikelets broadly elliptical and greatly laterally compressed before flowering. Glumes nearly equal, both 1-ribbed, or rarely the upper one 3-ribbed. Lower pale 3-ribbed, conspicuously keeled in the apical half. Caryops ovoid-linear, furrowed on the face.

SPECIES V.—**SCLEROCHLOA RIGIDA.** *Link.*

PLATE MDCCLVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLIX. Fig. 370.

Billot, Fl. Gall. et Germ. Exsicc. 486.

Glyceria rigida, *Sm.* Engl. Fl. Vol. I. p. 119. *Hook. fil.* Stud. Fl. p. 446.

Scleropoa rigida, *Griesb.* *Parl.* Fl. Ital. Vol. I p. 473. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 556.

Poa rigida, *Linn.* *Sm.* Engl. Bot. ed. i. No. 1371. *Hook. & Arn.* Brit. Fl. ed. viii. p. 550.

Festuca rigida, *Kunth*, Enum. Plant. Vol. I. p. 392. *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 936.

Annual. Without barren shoots. Flowering stems rather few, slender, wiry, erect or ascending, sometimes from a curved or geniculate base. Leaves narrowly linear, thin, not at all fleshy, nearly flat, tapering to the apex, with numerous slender prominent cartilaginous ribs; sheaths smooth, the uppermost one shorter than its leaf; ligule elongate, narrowly triangular, acute, often lacerate. Panicle distichously unilateral, racemose in the upper half, rather dense, triangular-oblong or linear-oblong. Rachis with approximate nodes, ancipitate-triquetrous. Panicle-branches rigid, solitary at each node of the rachis, the lowest ones forked from the base, the upper ones simple, ascending-erect in flower, ascending-spreading in fruit. Spikelets rather numerous, unilaterally, distichously, and racemosely disposed on and slightly diverging from the lower branches of the panicle, solitary and terminal on those in the upper half of the panicle; the lateral ones on pedicels about as long as the glumes; all 5- to 10-flowered, but usually 6- or 7-flowered. Glumes acute, scarcely hooded, 1-ribbed, rarely the upper one 3-ribbed, the upper one covering half the second floret and reaching up nearly to the base of the fourth floret. Florets separated from each other by a portion of the rachis as long as the width of the lower pale. Lower pale narrowly scarious at the apex, oblong-lanceolate in profile, gradually tapering to the apex, sub-obtuse, faintly mucronate, obsoletely 3-ribbed, the lateral ribs scarcely distinguishable, the midrib slender, excurrent, and forming a mucro.

On dry barren ground, wall tops, and rocks. Common and generally distributed in England, more rare in Scotland, where it appears to be confined to the eastern coast, reaching to the shores of the Dornoch Firth, Ross-shire. Rather local, but widely distributed in Ireland.

England, Scotland, Ireland. Annual. Summer.

Plant gregarious. Stems rather few in each individual tuft, 2 to 12 inches high. Leaves 1 to 4 inches long. Panicle $\frac{1}{2}$ inch to $4\frac{1}{2}$ inches, about 4 times as long as broad. Spikelets green, frequently tinged with purple, $\frac{1}{10}$ to $\frac{1}{4}$ inch long, according to the number of florets. Florets $\frac{1}{5}$ inch long.

Hard Meadow-Grass.

German, *Starren Schwingel.*

This neat little species is not uncommon on old walls and calcareous rocks, especially in oolitic districts. Wherever it occurs in a district, we assume that it indicates a sufficiency of lime in the soil.

SPECIES VI.—SCLEROCHLOA LOLIACEA. *Woods.*

PLATE MDCCLIX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXXV. Fig. 274.
Billot, Fl. Gall. et Germ. Exsicc. 2586.
Glyceria loliacea, *Watson; Hook. fil.* Stud. Fl. p. 446.
Scleropoa loliacea, *Gren. & Godr.* Fl. de Fr. Vol. III. p. 557.
Catapodium loliaceum, *Link; Lindl.* Syn. Brit. Fl. p. 297. *Parl.* Fl. Ital. Vol. I. p. 478. *Reich.* Ic. l.c. p. 32.
Poa loliacea, *Huds. Hook. & Arn.* Brit. Fl. ed. viii. p. 550.
Triticum loliaceum, *Sm.* Engl. Bot. ed. i. No. 221, & Engl. Fl. Vol. I. p. 185.
T. Rottböllia, *D.C.* Fl. Fr. Vol. III. p. 86.
Brachypodium loliaceum *Röm. & Schultes; Fries*, Summ. Veg. Scand. p. 75.
Festuca rottböllioides, *Kunth*, Enum. Plant. Vol. I. p. 395.

Annual. Without barren shoots. Flowering stems rather few, rather stout, rigid, decumbent or ascending from a curved or geniculate base, sometimes curved throughout. Leaves narrowly linear, thin, not at all fleshy, nearly flat, tapering to the apex, with numerous slender prominent cartilaginous ribs; sheaths smooth, the uppermost one about as long as its leaf; ligule elongate, oblong, truncate, often erose-denticulate. Panicle distichously unilateral, spicate, rather dense, linear. Rachis with approximate nodes, ancipitate-triquetrous. Panicle-branches all simple, rigid, solitary at each node of the rachis, resembling very short pedicels, or the lower ones slightly elongated and with 2 to 5 spikelets, erect in flower and fruit. Spikelets rather few, unilaterally, distichously, and subspicately disposed on and adpressed to the lower branches of the panicle, solitary and terminal on the extremely short branches of the upper half of the panicle, or throughout; the lateral and solitary ones subsessile; all 5- to 11-flowered, usually 7- or 8-flowered. Glumes obtuse, sometimes mucronate, hooded, 1-ribbed, or the upper one 3-ribbed; the upper one covering three-fourths of the second floret and reaching to the base of the fourth floret. Florets separated from each other by a portion of the rachis as long as half the width of the lower pale. Lower pale broadly scarious at the apex, oblong-elliptical in profile, abruptly narrowed at the apex, obtuse, finely mucronate, conspicuously 3-ribbed, the lateral ribs prominent, the midrib thick, shortly excurrent and forming a mucro.

On sandy sea-coasts and waste places by the sea; rather locally distributed round the whole of the English coast; rare in Scotland, where it is recorded from Wigton, Edinburgh, and Fife, and also from Forfarshire, but the last county requires to be confirmed by recent and reliable testimony. Rather local, but widely distributed in Ireland.

England, Scotland, Ireland. Annual. Summer.

Plant growing in small compound tufts with rather few stems in each individual tuft, 2 to 6 inches long. Leaves 1 to 2 inches long. Panicle 1 to $2\frac{1}{2}$ inches long by $\frac{1}{5}$ to $\frac{1}{2}$ inch broad. Spikelets green, rarely tinged with pale purple, $\frac{1}{5}$ to $\frac{2}{5}$ inch long. Florets about $\frac{1}{10}$ inch long.

Plant with the habit of Triticum, but the spike is unilateral with a distinct back and a face, the spikelets are not quite sessile, and the lower panicle-branches are sometimes developed, though rarely above $\frac{1}{4}$ inch long exclusive of the terminal spikelet.

Dwarf Meadow-Grass.

French, *Glycérie Ivraie.*

GENUS III.—**POA.** *Linn.*

Spikelets stalked, arranged in a loose open or somewhat contracted panicle, laterally compressed, open during flowering, each containing 2 to 8 perfect florets. Glumes 2, nearly equal, both shorter than the florets, not awned, usually both 3-ribbed, subherbaceous with scarious margins, rarely wholly subscarious. Pales 2, the lower one compressed, keeled, throughout entire, not awned, 3- to 5-ribbed, subherbaceous with scarious margins; upper pale 2-cleft, 2-ribbed. Lodicules 2, entire or bilobed. Stamens 3. Styles 2, terminal, very short; stigmas plumose, protruded at the sides of the floret, between the basal margins of the pales. Caryops free, glabrous, elliptical, trigonous, faintly channelled on the inner face.

The name of this genus of grasses is derived from the Greek word πόη, a grass.

SPECIES I.—**POA ANNUA.** *Linn.*

PLATE MDCCLX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLV. Figs. 387 and 388.
Billot, Fl. Gall. et Germ. Exsicc. No. 93.

Annual or biennial. No rootstock, stolons, or barren shoots. Stem ascending from a curved or geniculate and slender base which is sometimes rooting at the knots, or procumbent, rather thick, weak; the uppermost knot about one-third above the base.* Leaves thin, flaccid, rather broadly linear, flat, abruptly pointed and hooded at the apex, bright green; sheaths smooth, strongly ancipitate, none of them dilated, the uppermost one longer than its leaf; ligule very prominent, oblong, obtuse or truncate. Panicle erect, more or less distichously unilateral, deltoid or deltoid-triangular in outline, lax. Panicle-branches from 1 to 4 at the lower nodes of the rachis, but generally 2, unequal, the longer ones bare of spikelets and unbranched at the base for from one-third to half their length, spreading-ascending in flower, spreading or ascending-spreading in fruit, smooth. Spikelets ovate-lanceolate, 2- to 6-flowered, usually 4- or 5-flowered. Florets not connected at the base by arachnoid hairs. Lower glume 1-ribbed, the upper 3-ribbed. Lower pale green rarely suffused with purple, broadly white and scarious at the apex, with or without a red or purplish line between the green and white, subacute, faintly 5-ribbed, with the ribs more or less silky-hairy towards the base.

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* In this and all the following species of Poa, the whole of the panicle is included as part of the stem in estimating the position of the uppermost knot.

In waste places, cultivated ground, roadsides, meadows, &c.; extremely common, and universally distributed.

England, Scotland, Ireland. Annual or biennial. Spring to Winter.

Stems 2 to 18 inches long. Leaves 1 to 6 inches by $\frac{1}{10}$ to $\frac{1}{4}$ inch. Panicle $\frac{3}{4}$ to 4 inches. Spikelets $\frac{1}{8}$ to $\frac{1}{4}$ inch. Florets $\frac{1}{5}$ inch.

A species usually easily recognised by its fibrous root without any rootstock, though sometimes (especially in cultivated ground) where the stems have been buried, they root and put on the appearance of a rootstock. The whole plant is much softer and less rigid than any other species of the genus. The leaves are often crimped at the edges.

P. supina, *Schrad*, is said to be a mountain form with highly coloured spikelets, but I have not seen specimens.

French, *Paturin annuel*. German, *einjähriges Rispengras*.

This grass is the most common species to be found on way-sides and hedges, and grows abundantly in most pastures. Though called annual it is mostly biennial, and is capable of forming a very thick and productive turf. On most land it will often grow a foot or two high; and as it flowers nearly all the year round, it may be fed or cut many times in succession. It is only, however, in damp pastures that it can be advantageously grown.

SPECIES II.—**POA BULBOSA.** *Linn.*

PLATE MDCCLXI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLIV. Figs. 385 and 386.
Billot, Fl. Gall. et Germ. Exsicc. No. 482.

Perennial. Rootstock slender, not creeping, cæspitose, with very numerous and very short suberect slender stolons terminating in short leafy barren shoots, but no stolons, and with several flowering stems. Barren shoots on slender stalks or subsessile, swollen into elliptical-lanceolate bulbs at the base, with the outer sheaths membranous. Flowering stems erect or ascending from a geniculate base which is swollen into a more slender bulb than that of the barren shoots, slender, rather wiry, straight; the uppermost knot about one-third or one-fourth above the base. Leaves of the barren shoots and base of stem thin, flaccid, narrowly linear, flat, with a very deep central furrow, rather gradually pointed and hooded at the apex, bright green; stem leaves extremely short, channelled, and more hooded than those of the barren shoots; sheaths smooth, indistinctly ancipitate, the lowest ones greatly dilated, the uppermost one many times longer than its leaf; ligule very prominent, oblong-lanceolate, subacute. Panicle erect, nearly equal, deltoid-ovoid in flower, subcylindrical-ovoid in fruit, dense. Panicle-branches 1 to 3 at the lowest nodes of the rachis, but generally 2, unequal, the longer ones bare of spikelets and unbranched at the base for from one-fifth to one-third of their length, ascending-spreading in flower, erect and adpressed in fruit, slightly rough. Spikelets ovate, 3- to 6-flowered, usually 4- or 5-flowered. Florets connected at the base by arachnoid hairs. Glumes both 3-ribbed or the lower one 1-ribbed. Lower pale acuminate and very acute, indistinctly 5-ribbed, with the midrib and marginal ribs silky-hairy towards the base, green, more or less tinged with purple, rather broadly whitish and scarious at the apex.

On sand and fine shingle on the seashore. Near Plymouth, Devon; Shoreham, Sussex; St. Helen's Spit, Isle of Wight; Aldborough and Lowestoft, Suffolk; Yarmouth Denes, Norfolk, are the only stations in which it is certainly known to exist. It is said also to occur on the sandhills between Deal and Sandwich, but I have not observed it there, so that it must be very local, if not extinct in that locality.

England. Perennial. Spring, Early Summer.

Plant growing in dense tufts or mats. Leaves of the barren shoots 1 to 3 inches long. Flowering stems 3 inches to 1 foot high, uppermost stem leaf $\frac{1}{8}$ to $\frac{1}{2}$ inch long by $\frac{1}{12}$ to $\frac{1}{10}$ inch broad. Panicle $\frac{3}{4}$ to $1\frac{1}{2}$ inch long. Spikelets $\frac{1}{8}$ to $\frac{1}{6}$ inch long. Florets $\frac{1}{4}$ inch long.

Well distinguished by its bulbs, which late in summer, when the leaves are withered, become detached from the soil in tufts, which are carried about by the wind.

On the continent it is often viviparous, but has not been observed in this condition in Britain.

The bulbs remain when the plant is subjected to pot culture. They divide like shallots, and the cloves afterwards usually become more or less evidently stalked.

Bulbous Meadow-Grass.

French, *Pâturin bulbeux.* German, *Zwiebeliges Rispengras.*

SPECIES III.—POA ALPINA. *Linn.*

PLATE MDCCLXII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLVI. Figs. 392 and 393.
Billot, Fl. Gall. et Germ. Exsicc. No. 1380.

Perennial. Rootstock thick, shortly creeping, usually without æstival leafy barren shoots or stolons, with subsolitary flowering stems. Flowering stems erect, often from a curved base which is swollen into a cylindrical bulb, with the outer sheaths fibrous, slender, rather wiry, generally bent at the knots, the uppermost knot about one-third or one-fourth above the base. Leaves at the base of the flowering stem thick, firm, broadly linear, nearly flat, abruptly pointed and hooded at the apex, green, slightly glaucous; stem leaves extremely short, channelled, and more hooded at the apex than the radical ones; sheaths smooth, ancipitate; ligule very prominent, oblong-lanceolate, truncate and erose. Panicle erect, nearly equal, or somewhat distichously unilateral, deltoid-ovoid in flower, rhombic-ovoid in fruit, rather dense. Panicle-branches 1 to 3 at the lowest nodes of the rachis, but generally 2, unequal, the longer ones bare of spikelets and unbranched at the base for from one-third to one-half their length, spreading in flower, erect-ascending or ascending in fruit, slightly rough. Spikelets ovate, 2- to 6-flowered, usually 4- or 5-flowered. Florets not connected at the base by arachnoid hairs. Glumes both 3-ribbed, or the lower one 1-ribbed. Lower pale acuminate and acute, indistinctly 5-ribbed, with the midrib and marginal ribs silky-hairy in the lower two-thirds, green, often more or less suffused with purple, broadly brownish-white and scarious at the apex.

Among rocky débris, on ledges of rock, and in grassy places on mountains. Frequent. Snowdon, Carnarvon; Ingleborough, Yorkshire; and in the Lake district. Common in the Scotch Highlands, reaching to Sutherland. Kerry and Sligo, Ireland.

England, Scotland, Ireland. Perennial, Summer.

Stems 3 to 18 inches high, generally solitary, rarely more than 2 in a tuft, thickly clothed by the fibrous remains of decayed leafsheaths at the base, giving to the bulb somewhat of the appearance of Lloydia serotina. Leaves 1 to 5 inches long by $\frac{1}{8}$ to $\frac{1}{4}$ inch broad, almost fleshy. Panicle $\frac{3}{4}$ to 2 inches long, most commonly viviparous. Spikelets $\frac{1}{6}$ to $\frac{1}{4}$ inch long. Florets $\frac{1}{6}$ inch long.

Out of thousands of wild specimens I have never seen one with the rootstock and base of the stem unclothed with the decayed bases of former leafsheaths, which give it the sub-bulbous appearance above mentioned; but in cultivation, either from more rapid growth of the rootstock, or more rapid decay of the leafsheaths, this peculiarity sometimes disappears, as may be seen in the original figure in "English Botany," which is given in the present edition on the right of the plate.

Alpine Meadow-Grass.

French, *Pâturin des Alpes.* German, *Gebirgs-Rispengras.*

SPECIES IV.—POA LAXA. *Hänke.*

PLATES MDCCLXIII. MDCCLXIV.

Rootstock rather slender, very shortly or not at all creeping, cæspitose, with æstival leafy barren shoots but no stolons, with numerous or several flowering stems. Flowering stems erect or ascending sometimes from a curved or geniculate base which is scarcely swollen, with the outer sheaths membranous, slender, weak, not bent at the upper knots; the uppermost knot at about one-fourth above the base. Leaves at the base of the flowering stem thin, narrowly linear, tapering, flat, gradually pointed and not hooded, or rather abruptly pointed and hooded at the apex; stem leaves not much shorter than the radical ones, and in other respects similar to them; sheaths smooth, the uppermost one longer than its leaf; ligule very prominent, oblong-triangular, subtruncate and lacerate. Panicle slightly drooping, nearly equal, or somewhat distichously unilateral, deltoid-ovoid in flower and afterwards, or rhombic- or fusiform-ovoid in both stages, rather lax or rather dense. Panicle-branches 1 to 3 at the lowest nodes of the rachis, but generally 2, unequal, the longer ones bare of spikelets and unbranched at the base for half or two-thirds of their length, ascending or erect in flower and fruit, or spreading in fruit, very slightly rough. Spikelets broadly ovate, 2- to 6-flowered, usually 3- or 4-flowered in the British forms. Florets more or less connected at the base by arachnoid hairs. Glumes both 3-ribbed or the lower one 1-ribbed. Lower pale acuminate and acute or simply acute, obsoletely 5-ribbed, with the midrib and marginal ribs silky-hairy towards the base, green, more or less suffused with purple, broadly brownish-white and scarious at the apex.

SUB-SPECIES I.—**Poa stricta.** *Lindeberg.*

PLATE MDCCLXIII.

Fries, Herb. Norm. Fasc. xv. No. 94.
Poa laxa, *Bab.* Man. Brit. Bot. ed. vi. p. 413.
Poa laxa var. vivipara, *Anderss.* Gram. Scand. p. 43.

Rootstock shortly creeping, somewhat oblique, cæspitose at the apex. Stems firm, straight. Leaves flat, gradually tapering to the apex, not hooded; uppermost sheath 2 to 4 times longer than its leaf; ligules all elongate. Panicle open in flower and more so afterwards. Panicle-branches slender, diverging in flower, afterwards spreading. Spikelets ovate, 2- to 3-flowered, always (?) viviparous. Florets scarcely connected by arachnoid hairs. Lower pale somewhat acuminate and acute, dark purple, narrowly green on the keel, with rather narrow brownish-white margins.

On rocky débris and damp ledges of rocks, on high mountains, very rare. Loch-na-gar, Aberdeen, where I have gathered it on the rocky débris under the south-east corner of the great precipice, and on rocks in the corrie of Lochan-an-ean. Ben Nevis, Inverness, Prof. Babington!

Scotland. Perennial. Autumn.

Plant growing in tufts containing 2 to 12 flowering stems from 3 inches to 1 foot high. Longest leaves $1\frac{1}{2}$ to 4 inches long, uppermost stem leaf $\frac{3}{4}$ to 2 inches long. Panicle 1 to $2\frac{1}{2}$ inches long, resembling that of P. alpina, but always slightly drooping at the apex. Spikelets $\frac{1}{6}$ inch long. Florets about $\frac{1}{8}$ inch, almost all viviparous and the few which are not so appear to produce no seed. Anthers $\frac{1}{12}$ inch long.

Professor Babington considers this as the typical P. laxa of Hänke. This is very doubtful, as P. stricta is confined to the northern parts of Europe, Scotland, and Norway, and is not known to occur in the Alps of Southern Europe.

Straight-Stemmed Meadow-Grass.

(?) SUB-SPECIES II.—Poa eu-laxa.

PLATE MDCCLXIV.

Billot, Fl. Gall. et Germ. Exsicc. No. 3267.
Poa laxa, "*Hänke.*" *Kunth.* Enum. Plant. Vol. I. p. 344. *Sm.* Engl. Fl. Vol. I. p. 122. *Koch.* Syn. Fl. Germ. et Helv. ed. ii. p. 926. *Gren.* & *Godr.* Fl. de Fr. Vol. III. p. 540. *Parl.* Fl. Ital. Vol. I. p. 346. *Fries*, Summ. Veg. Scand. p. 77.
P. flexuosa, *Sm.* Engl. Bot. ed. i. No. 1123. non *Wahl.*
P. elegans, *D.C.* Fl. Fr. Vol. III. p. 62.
Poa minor. *Bab.* Man. Brit. Bot. ed. vi. p. 412. non *Gaud.*
P. laxa, var. minor. *Hook. fil.* Stud. Fl. p. 414.

Rootstock not at all creeping, densely cæspitose. Stems weak, curving by their own weight. Leaves flat towards the base, channelled, and abruptly pointed and hooded at the apex; uppermost sheath 2 to 3 times as long as its leaf; ligule of the uppermost stem leaf elongate, those of the lower leaves and of the barren shoots quadrate, not longer than broad. Panicle slightly open and rhomboidal in flower, closed and fusiform-cylindrical in fruit. Panicle-branches very slender, ascending in flower, erect in fruit. Spikelets ovate, 1- to 4-flowered, but generally 2- or 3-flowered, never (?) viviparous. Florets very slightly connected by arachnoid hairs. Lower pale subacute, glaucous green, more or less faintly stained with purple, with broad brownish-white margins.

On rocky débris and dry ledges of rocks, on high mountains; rare. Loch-na-gar, Aberdeen, where I have gathered it on the rocky débris under the south-east corner of the great precipice, and on rocks at the north-west margin of the same corrie, and on rocks on the north slope of Cairn-Towl, Aberdeen. Ben Nevis, Inverness. "Mr. John Mackay" (Smith, "English Botany").

England. Perennial. Autumn.

Plants growing in dense tufts, without any appearance of a creeping rhizome. Stems often very numerous, so weak that they bend by the weight of the panicle, 3 to 9 inches long. Leaves 1 to 3 inches, the uppermost stem leaf 1 to 2 inches. Panicle $\frac{3}{4}$ to 2 inches long. Spikelets $\frac{1}{6}$ to $\frac{1}{5}$ inch long. Spikelets about $\frac{1}{8}$ inch long.

This differs from P. stricta (with which perhaps it ought not to be combined as a subspecies) by having the leaves channelled and hooded towards the apex; the stems and panicle-branches more slender and weaker, the panicle closed after flowering; the arachnoid hairs at the base of the florets longer; the spikelets paler coloured, and apparently never viviparous, even when the plant grows intermixed with P. stricta.

A third subspecies of P. laxa, viz. P. minor, *Gaudin*, occurs in the Alps of Southern Europe, but has not been detected in Britain. It has the stems fewer and still more slender and weak than in P. eu-laxa, and the panicle-branches capillary, the spikelets oblong-lanceolate, 4- to 6-flowered, the florets connected by more abundant arachnoid hairs, and the lower pales more acuminate: the leaves and ligules similar to those of P. eu-laxa, but narrower.

Reichenbach's figure of P. laxa represents a plant with a creeping rootstock, so that I hesitate to quote it under P. eu-laxa.

Wavy Meadow-Grass.

French, *Pâturin lâche.* German, *Schlaffes Rispengras.*

SPECIES V.—**POA GLAUCA.** *Smith.*

PLATES MDCCLV. MDCCLXVI. MDCCLXVII.

P. nemoralis, var. glauca, *Hook fil.* Stud. Fl. p. 43. non *Koch.*

Rootstock slender, more or less shortly creeping, with solitary or few or numerous flowering stems, not stoloniferous, or with very short autumnal stolons, without æstival leafy barren shoots. Stems erect, usually from a curved base, not swollen at the base, glaucous; the uppermost knot rarely higher than from one-sixth or one-third above the base, rarely near the middle of the stem. Leaves linear, parallel-sided and abruptly pointed and hooded, or narrowly linear, tapering towards the apex and gradually pointed and hooded, glaucous, often intensely so; sheaths smooth or nearly so, compressed and ancipitate, the uppermost one as long as or a little longer than its leaf; ligule rather prominent, quadrate or a little broader than long, truncate. Panicle erect, distichously-unilateral, more rarely nearly equal and slightly drooping at the apex, triangular in flower and afterwards, or rhombic-ovoid in flower and linear afterwards, lax. Panicle-branches 1 to 5 at the lowest nodes of the rachis, but generally 2, the longest ones unbranched and bare of spikelets at the base for from one-third to half their length, spreading in flower and sometimes in fruit, but more often erect and adpressed in fruit, more or less scabrous. Spikelets ovate-oblong or elliptical-lanceolate, 2- to 6-flowered. Glumes both 3-ribbed. Florets free, or more or less connected at the base by arachnoid hairs. Lower pale subacute or subobtuse, obsoletely 5-ribbed, with the midribs and marginal-ribs silky-hairy at the base or in the lower half, glaucous-green, more or less suffused with purple, with a reddish-brown blotch near the apex, and narrow white scarious margins.

SUB-SPECIES I.—**Poa cæsia.** *Smith.*

PLATE MDCCLXV.

Smith, Engl. Bot. ed. i. No. 1719. non *Aliorum.*
P. glauca, var. β. *Sm.* Engl. Fl. Vol. I. p. 128.

Densely cæspitose. Rootstock scarcely creeping. Flowering stems numerous, ascending, generally curved throughout, decumbent at the base, rather stout, rigid, smooth (except underneath the panicle), intensely glaucous; the uppermost knot one-third to one-fourth above the base. Leaves broadly linear, parallel-sided, abruptly acuminate and greatly hooded or rather boat-shaped at the apex, intensely glaucous;

sheaths nearly smooth, acutely ancipitate, the uppermost one a little longer than its leaf; ligule more than twice as broad as long, obliquely truncate and obtuse-angled. Panicle erect, distichously unilateral, deltoid-triangular in flower and fruit, or somewhat rhombic in fruit. Panicle-branches 2 to 5 at the lower nodes of the rachis, but usually 2 or 3, rigid, spreading in flower and fruit, or ascending in fruit, bare of spikelets and unbranched at the base for about one-third to one-half their length, scabrous. Spikelets ovate-oblong, 3- to 6-flowered, but usually 4- or 5-flowered. Glumes acute, both shorter than the lowest floret. Florets not connected at the base by arachnoid hairs. Lower pale subobtuse, glaucous-green, variegated with pale purple and reddish, with rather narrow white scarious margins.

Said by Smith to have been sent from Scotland to Mr. Fairbairn of Chelsea Garden, and also sent to himself from the garden of Mr. J. Mackay, who alleged that he had brought it from Ben Lawers and other Highland mountains, but no wild specimens are known to exist.

Scotland? Perennial. Summer, Autumn.

Plant growing in dense tufts producing a succession of ascending flowering stems 1 to 2 feet high. Leaves $1\frac{1}{2}$ to 3 inches long by $\frac{1}{8}$ to $\frac{1}{5}$ inch broad, very similar to those of Poa pratensis, var. sub-cærulea, but intensely glaucous, or rather cæsious, as there is a blue tinge in the white. Panicle 1 to 4 inches long. Spikelets $\frac{1}{5}$ to $\frac{1}{4}$ inch long. Florets $\frac{1}{8}$ inch long.

I am indebted to Mr. T. Moore for living specimens from Chelsea Garden of the plant from which the preceding description was taken. There are no wild specimens in Smith's herbarium; the grass so labelled from Ben Lawers I am informed by the Rev. W. W. Newbold is not the same as the cultivated specimens. In the herbarium of the University of Edinburgh there is a Poa from Glen Isla, Forfarshire, collected by Dr. Balfour, which shows the nearest approach to P. cæsia of any wild specimens I have seen.

P. cæsia grows very freely in lowland gardens, and springs up self-sown, while P. eu-glauca and P. Balfourii can with difficulty be kept alive in cultivation in the open ground.

Cæsious Meadow-Grass.

SUB-SPECIES II.—**Poa eu-glauca.**

PLATE MDCCLXVI.

P. glauca, *Sm.* Engl. Bot. ed. i. No. 1720.
P. glauca, var. α, *Sm.* Eng. Fl. Vol. I. p. 128 (ex parte).
P. cæsia, *Bab.* Man. Brit. Bot. ed. vi. p. 413. non *Smith.*
P. nemoralis, var. δ, *Hook. & Arn.* Brit. Fl. ed. viii. p. 553.

Not cæspitose. Rootstock rather shortly creeping. Flowering stems solitary, or more rarely 2 to 5, erect, slightly curved throughout, usually sharply curved or geniculate at the base, rather slender, rigid, smooth, intensely glaucous; the uppermost knot one-fifth to one-sixth above the base. Leaves narrowly linear, tapering, gradually pointed and slightly hooded at the apex, intensely glaucous; sheaths nearly smooth, acutely ancipitate, the uppermost one a little longer than its leaf; ligule about thrice as broad as long, truncate. Panicle erect, distichously unilateral, triangular in flower, rhombic or oblong in fruit; panicle-branches 1 to 3 at the lower nodes of the rachis, but generally 2, rigid, spreading in flower, ascending or erect in fruit, bare of spikelets and unbranched at the base for from one-half to two-thirds of their length, scabrous. Spikelets elliptical, 2- to 6-flowered, usually 2- or 3-flowered. Glumes acuminate, the larger one as long as or very little shorter than the first floret. Florets not connected at the base by arachnoid hairs. Lower pale acute or subacute, dark purple more or less tinged with glaucous-green, reddish-brown towards the apex, with narrow white scarious margins.

On damp ledges of rock on high mountains, rare, and very local. Snowdon, Carnarvon (?); Canlochen Glen, and Glen Isla, Forfar; Stuich-an-lochan and rocks on the north-west side of Ben Lawers, Perthshire.

England (?), Scotland. Perennial. Late Summer, Autumn.

Rootstock often an inch or more in length, slender. Stems 4 inches to 1 foot high, solitary or few together, from the apex of the rootstock. Leaves $\frac{3}{4}$ to 2 inches long, by $\frac{1}{12}$ to $\frac{1}{10}$ inch broad. Panicle $\frac{3}{4}$ inch to 3 inches long. Spikelets $\frac{1}{10}$ to $\frac{1}{4}$ inch long. Florets $\frac{1}{10}$ inch long.

Differs from P. cæsia in the rootstock being conspicuously creeping and the plant not at all cæspitose, in the stem being more slender and its uppermost knot lower down, in the leaves being much narrower, more tapering, more gradually pointed, and not boat-shaped at the apex. There are fewer leaves at the base of the stems; the panicle is more lax and has longer branches; the spikelets are more pointed at each end, the glumes more acuminate and longer in proportion.

The plant has much the habit of P. distichophylla *Gaudin* (one of the forms of P. Cenisia *All.*), but has the rootstock much less extensively creeping, and is destitute of elongate stolons terminating in barren tufts.

I believe Mr. W. Wilson's specimens from Snowdon to be P. euglauca. I have not seen recent Welsh specimens, and have too imperfect dried ones to feel certain as to their nomenclature.

Glaucous Meadow-Grass.

SUB-SPECIES III.—**Poa Balfourii.** "*Parnell.*" (*Bab.*)

PLATE MDCCLXVII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLVIII. Fig. 400.
P. cæsia, *Reich.* Ic. l.c. p. 51.
P. nemoralis, var. ε, *Hook & Arn.* Brit. Fl. ed. viii. p. 553.
P. glauca, var. α, *Sm.* Engl. Fl. Vol. I. p. 128 (ex parte).

Subcæspitose. Rootstock rather shortly creeping. Flowering stems few or rather numerous, erect, straight, usually sharply curved or geniculate at the base, slender, not rigid, smooth, glaucous; the uppermost knot one-third or one-fourth above the base, rarely near the middle (?). Leaves narrowly linear, narrowed upwards, gradually pointed and hooded at the apex, glaucous; sheaths nearly smooth, ancipitate, the uppermost one about as long as its leaf; ligule about twice as broad as long, obliquely-truncate, obtuse. Panicle erect, or slightly secundly drooping, more or less distichously unilateral (particularly in small examples), rhombic-triangular in flower, oblong or linear in fruit. Panicle-branches 2 to 5 at the lower nodes of the rachis, but usually 2, not rigid, spreading-ascending or ascending in flower, erect and often adpressed in fruit, the longer ones bare of spikelets and unbranched at the base for from one-third to one-half their length, scabrous. Spikelets elliptical, 2- to 5-flowered, but usually 3- or 4-flowered. Glumes acuminate, the larger one as long as or even a little longer than the first floret. Florets more or less connected at the base by arachnoid hairs. Lower pale subobtuse or subacute, pale green variegated with pale violet with a reddish-brown stain at the apex, and with narrow white scarious margins.

Var. α, *genuina.*

PLATE MDCCLXVII.

P. Balfourii, *Parn.* Grasses of Brit. p. 145.

Stem with the uppermost knot not higher than one-third above the base. Spikelets usually 3- or 4-flowered. Florets more or less connected at the base by arachnoid hairs.

(?) Var. β, *ambigua.*

P. Balfourii, var. β, montana, *Bab.* Man. Brit. Bot. ed. vi. p. 414.
P. nemoralis, var. montana, *Bab.* Man. Brit. Bot. ed. iv. p. 412. non *Gaud.*
P. montana, *Parn.* Grass of Brit. p. 86.

Uppermost knot often about the middle of the stem. Spikelets usually 2- or 3-flowered. Florets not connected at the base by arachnoid hairs. Plant less glaucous than var. α.

On rocky débris and ledges of rock on mountains. Not uncommon. Snowdon, Carnarvon (?); Ingleborough, Yorkshire (?); the Cheviots, Northumberland (!); Clova Mountain, Forfarshire; Ben Voirlich and the Breadalbane Mountains, Perthshire. "Loch-na-gar, Mr. R. Mackay, also on rocks north base of the Mourne at Castleton" Braemar. (Dickie's Botanist's Guide.)

England, Scotland. Perennial. Late Summer.

Stems 6 to 8 inches high. Leaves 1 to 3 inches long by $\frac{1}{12}$ to $\frac{1}{8}$ inch broad. Panicle 1 to 5 inches long. Spikelets $\frac{1}{6}$ to $\frac{1}{4}$ inch long. Florets $\frac{1}{6}$ inch long.

Very closely allied to P. eu-glauca, from which it is often impossible to distinguish it in herbarium specimens: but the two forms are readily separable when growing. P. Balfourii grows in tufts and has the flowering stem and panicle-branches weak, not rigid as in P. eu-glauca; the ligule is longer and the whole plant is less glaucous, and without the bluish or cæsious tinge of P. eu-glauca. The panicle is longer and narrower, much more closed in fruit, except in small stunted specimens in which the branches are often spreading even after flowering. In luxuriant specimens also the panicle becomes nearly equal, and often droops over to one side.

I follow Professor Babington in placing P. montana *Parnell* as a variety of P. Balfourii. If I am right in referring a plant which I collected in Canlochen Glen to P. montana, I have little doubt that he is correct, as it has the elongate ligule of P. Balfourii and not the scarcely apparent one of P. nemoralis. But the greater proportion of specimens which I have seen labelled P. montana *Parnell* are alpine forms of P. nemoralis, although Dr. Parnell himself, in his description, distinguishes his P. montana from P. nemoralis by the ligules of the former being very conspicuous. The presence or absence of arachnoid hairs at the base of the florets is a character which varies so greatly in the same species that no reliance whatever can be placed on it, though these hairs are in some species of Poa more often developed than in others.

I do not venture to quote continental synonyms under the subspecies of Poa glauca, on account of not having access to authentic specimens.

Balfour's Meadow-Grass.

SPECIES VI.—POA NEMORALIS. *Linn.*

PLATES MDCCLXVIII. MDCCLXIX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLIX. Figs. 403 to 408.
Billot, Fl. Gall. et Germ. Exsicc. No. 1786.

Cæspitose. Rootstock slender, very shortly creeping, with several or numerous flowering stems, not stoloniferous, or with very short autumnal stolons, without æstival leafy barren shoots. Stems erect, not swollen at the base, green, rarely glaucous; the uppermost knot about the middle of the stem. Leaves narrowly linear, tapering towards the apex, gradually pointed and hooded, green, rarely slightly glaucous; sheaths smooth, slightly compressed and bluntly ancipitate, the upper one usually shorter than its leaf, rarely as long as its leaf; ligule extremely short, truncate. Panicle erect or drooping at the apex, usually nearly equal and pyramidal in flower, but sometimes partially distichously secund and oblong in flower, usually closed and linear in fruit. Panicle-branches 1 to 5 at the lower nodes of the rachis, but usually 3 or 4, the longer ones unbranched and bare of spikelets at the base for about half their length, spreading or spreading-ascending in flower, commonly erect and often adpressed in fruit, scabrous. Spikelets elliptical-lanceolate, 1- to 6-flowered. Glumes both 3-nerved. Florets free, or more or less connected at the base by arachnoid hairs. Lower pale acute or subacute, obsoletely 5-ribbed, with the midrib and marginal ribs silky-hairy in the lower third, wholly pale green, rarely tinged with pale purple, especially towards the tip, with narrow white scarious margins.

Var. α, *vulgaris*. Gaud.

PLATE MDCCLXVIII.

Green. Stem weak, not at all rigid. Uppermost sheath usually shorter than its leaf. Panicle erect or slightly drooping, lax, equal, broadly pyramidal and open in flower, closed afterwards. Spikelets 3- to 5-flowered, pale green.

Var. β, *angustifolia*. Parn.

Green. Stem weak. Uppermost sheath scarcely half the length of its leaf. Panicle erect, lax, equal, narrow, slightly open in flower, closed afterwards. Spikelets 1- to 3-flowered, usually 2-flowered, pale green.

Var. γ, *coarctata*. Gaud.

Slightly glaucous. Stem firm. Uppermost sheath scarcely half the length of its leaf. Panicle erect, nearly equal, narrow, contracted in flower and closed in fruit. Spikelets 3- or 4-flowered, stained with purple and reddish-brown.

Var. δ, *glaucantha.* Reich.

P. nemoralis, var. glauca, *Bab.* Man. Brit. Bot. ed. vi. p. 413. (non *Gaud.*?)

Glaucous. Stem rather firm. Uppermost sheath about as long as its leaf. Panicle slightly drooping, lax, equal, pyramidal in flower, closed afterwards. Spikelets 2- to 4-flowered, glaucous green, sometimes tinged with pale purple.

Var. ε, *Parnellii.* Hook & Arn.

PLATE MDCCLXIX.

Billot, Fl. Gall. et Germ. Exsicc. No. 3685.

Slightly glaucous. Stem rather weak. Uppermost sheath as long as or even longer than its leaf. Panicle secundly drooping,* lax, equal, broadly pyramidal and open in flower, closed afterwards. Spikelets 2- to 4-flowered, but usually 2- or 3-flowered, green, often faintly tinged with purple.

Var. ζ, *divaricata.*

Green. Stem rather weak. Uppermost sheath as long as or longer than its leaf. Panicle erect, lax, distichously unilateral, oblong-triangular and open in flower and fruit. Spikelets 1- to 4-flowered, but usually 2-flowered, green, often tinged with pale purple.

Varieties α and β in woods and on hedge banks, rather common and generally distributed in England; more rare in Scotland, extending to Elgin and Dumbarton. Var. γ on walls and in dry places in England and Scotland. Var. δ on mountains (Snowdon ?). Var. ε on rocks, Teesdale. Var. ζ in woods in hilly districts, Breadalbane and Braemar. Some of these varieties occur in the east and north of Ireland, but I do not know which.

England, Scotland, Ireland. Perennial. Summer.

A very variable plant, the stems from 9 inches to 3 feet high. Leaves 2 to 6 inches long, or even more in var. β, by $\frac{1}{12}$ to $\frac{1}{6}$ inch broad, with extremely short ligules. Panicle $1\frac{1}{2}$ to 6 inches long. Spikelets $\frac{1}{8}$ to $\frac{1}{4}$ inch long, florets about $\frac{1}{8}$ inch long.

Of these varieties the most remarkable is var. ζ, which has a distichously secund rigid panicle with the lower branches in pairs only, as in P. eu-glauca and P. Balfourii, from which it and all the other forms differ by having the ligule extremely short, and the uppermost knot always about the middle of the stem; most of the forms of P. nemoralis besides are far less glaucous in colour and have the spikelets much less tinged with violet, but certainly it is sometimes difficult (at least when the plants are dried) to separate some of the forms of P. nemoralis from some of those of P. glauca.

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* Babington says "erect." I have not seen the wild plant alive, but in cultivation the panicle is conspicuously drooping and secund.

Wood Meadow-Grass.

French, *Pâturin des bois.* German, *Hain-Rispengras.*

SPECIES VII.—POA COMPRESSA. *Linn.*

PLATE MDCCLXX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLVIII. Fig. 401.
Billot, Fl. Gall. et Germ. Exsicc. No. 1382.

Not cæspitose. Rootstock slender, extensively creeping, producing few or several flowering stems and long or short stolons terminating in vernal or æstival leafy shoots or leafy barren stems. Flowering stems erect or ascending from a curved or geniculate base, not swollen at the base, green; the uppermost knot usually above the middle of the stem. Leaves narrowly linear, parallel-sided, rather abruptly pointed and hooded at the apex, dull opaque green; sheaths smooth or nearly so, very greatly compressed and ancipitate, the uppermost one about as long as or longer than its leaf; ligule slightly prominent, 4 or 5 times as broad as long, transversely truncate. Panicle erect, indistinctly distichously unilateral, oblong or rhombic-oblong in flower, narrowly oblong and lobed afterwards, dense. Panicle-branches 2 to 5 at the lowest nodes of the rachis, but generally 2, the longest ones unbranched and bare of spikelets at the base for from one-fourth to one-half their length, ascending in flower, and erect and generally adpressed in fruit, scabrous. Spikelets narrowly oblong-lanceolate, 4- to 9-flowered. Glumes both 3-ribbed. Florets usually connected at the base by a few arachnoid hairs. Lower pale subobtuse, obsoletely 3-ribbed or more rarely 5-ribbed, with the midribs and marginal-ribs silky-hairy at the base or in the lower half, pale dull green often slightly tinged with pale dusky purple and with very narrow white scarious margins towards the apex only.

Var. *α*, *genuina.*

PLATE MDCCLXX.

P. compressa, *Parn.* Grasses of Britain, p. 80. *Bab.* Man. Brit. Bot. ed. iv. p. 402.

Uppermost knot about the middle of the stem. Spikelets 5- to

9-flowered. Florets connected by arachnoid hairs. Lower pale obsoletely 3-ribbed.

Var. β, *polynoda.*

P. polynoda, *Parnell*, Grasses of Britain, p. 84. *Bab.* Man. Brit. Bot. ed. iv. p. 403.

Uppermost knot above the middle of the stem, often two-thirds from the base. Spikelets 4- to 6-flowered. Florets free or with but a single arachnoid hair at the base. Lower pale obsoletely 5-ribbed. Stem more decumbent, knots more numerous, ligule longer, panicle more contracted and with shorter branches than in var. α.

In dry fields and on banks, on walls and amongst rocky débris. Not very common but generally distributed in England. Local in Scotland and very scarce north of the Forth and Clyde, though it is said to occur in Forfarshire, and I have myself gathered it on the shores of the Dornoch Firth, near the Mickle Ferry, Rosshire: in this last station, however, it may have been introduced, as it was in but small quantity. Very rare in Ireland, the only certain locality being in the neighbourhood of Londonderry. Var. β in very dry places and among stones.

England, Scotland, Ireland. Perennial. Summer.

Flowering stems solitary or in loose tufts 6 inches to 2 feet high; knots of the stem usually dark brownish-purple. Longest leaves 1 to 4 inches long by $\frac{1}{12}$ to $\frac{1}{8}$ inch broad. Panicle $\frac{3}{4}$ to 4 inches long. Spikelets $\frac{1}{8}$ to $\frac{1}{4}$ inch long. Florets about $\frac{1}{8}$ inch long.

Professor Babington does not now consider P. polynoda as worth notice even as a variety, and perhaps it should be considered as a depauperised state, but I have not been able to test this by cultivation. The extremes are certainly widely different in appearance, but it is difficult to draw a line between them, as there is no constant correlation of distinctive characters. Poa subcompressa, *Parnell*, is one of these intermediate forms, having 5-ribbed pales and distinctly webbed florets.

P. compressa differs from the other British species of Poa by having the spikelets less compressed, the lower pale ultimately parchment-like as in the genus Sclerochloa, and with the edges involute, so that in fruit the florets appear more distant from each other than in our other species. The ribs on the pale are extremely faint; indeed, the panicle and spikelets resemble those of a Sclerochloa, except that the lower pale is keeled from the base to the apex.

Flat-stemmed Meadow-Grass.

French, *Pâturin comprimé.* German, *Zusammengedrucktes Rispengras.*

SPECIES VIII.—POA PRATENSIS. *Linn.*

PLATES MDCCLXXI. MDCCLXXII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXI. Figs. 413 to 417.
Billot, Fl. Gall. et Germ. Exsicc. No. 3488.

Rootstock slender, extensively creeping, producing few or several flowering stems, and long or short stolons terminating in vernal or æstival leafy barren shoots. Flowering stems erect, usually curved at the base, not swollen at the base, green or slightly glaucous; the uppermost knot one-fourth to one-third above the base. Leaves linear or narrowly linear, parallel-sided, rather abruptly pointed and hooded at the apex, bright green or slightly glaucous; sheaths smooth or nearly so, compressed, those of the barren shoots greatly so, and ancipitate, the uppermost one on the stem about two or three times as long as its leaf; ligule rather prominent, rather broader than long, obliquely truncate. Panicle more or less drooping at the apex, equal, oblong-pyramidal or deltoid pyramidal in flower and fruit, or rhombic-oblong or narrowly oblong in fruit, lax or rather dense. Panicle-branches 2 to 5 at the lowest nodes of the rachis, but generally 3 to 5, the longest ones unbranched and bare of spikelets at the base for from one-fourth to one-half their length, spreading and often arching-drooping in flower and fruit, or ascending or even erect in fruit, cabrous. Spikelets lanceolate-elliptical, 2- to 6-flowered, but usually 3- or 4-flowered. Lower glume 1-ribbed, upper one 3-ribbed. Florets connected at the base by numerous arachnoid hairs. Lower pale acuminate and acute, conspicuously 5-ribbed, with the midrib and marginal-ribs silky-hairy in the lower half, green, frequently tinged with purple, and with narrow white scarious margins towards the apex only.

Var. α, *vulgaris*. Gaud.

PLATE MDCCLXXI.

P. pratensis, *Sm.* Eng. Bot. ed. i. No. 1073.

Leaves of the barren shoots about as broad as those on the flowering stems, flat, green. Panicle oblong-pyramidal, many-flowered, open after flowering.

Var. β, *angustifolia*. Gaud.

P. angustifolia, *Linn.* Sp. Plant. p. 99.

Leaves of the barren shoots much narrower than those of the stem, very long, flat, green. Panicle pyramidal, many-flowered, open after flowering.

Var. γ, *subcærulea.* Sm.

PLATE MDCCLXXII.

P. subcærulea, *Sm.* Engl. Bot. ed. i. No. 1004.

Leaves of the barren shoots as broad as those of the stem, short, flat, slightly glaucous or purplish. Panicle deltoid-pyramidal, commonly rather few-flowered, open after flowering.

Var. δ, *strigosa.* Gaud.

Leaves of the barren shoots much narrower than those of the stem, at length convolute, slightly glaucous or purplish. Panicle oblong, closed after flowering.

In meadows, pastures, cultivated ground, and waste places; very common and universally distributed. Var. β chiefly in woods and shady places. Var. γ in dry places, especially wall-tops and stony ground and on mountains. Var. δ on wall-tops and stony and sandy places.

England, Scotland, Ireland. Perennial. Summer.

Var. α has the stems 9 inches to 2 feet high, longest leaves 4 to 8 inches long by $\frac{1}{6}$ to $\frac{1}{5}$ inch broad. Panicle 2 to 5 inches; spikelets about $\frac{1}{6}$ inch; florets $\frac{1}{10}$ inch, green, or slightly tinged with dull purple.

Var. β has the stems 1 to 2 feet high, leaves of the barren shoots 6 inches to 1 foot long by $\frac{1}{12}$ to $\frac{1}{10}$ inch broad, those of the stem shorter and $\frac{1}{5}$ to $\frac{1}{6}$ inch broad. Panicle 3 to 6 inches long. Spikelets and florets about the same size as in var. α, or a little smaller, green.

Var. γ has the stems 3 to 8 inches high, the longest leaves 1 to 3 inches long by $\frac{1}{6}$ inch broad, the uppermost stem leaf much hooded, so as to be boat-shaped. Panicle 1 to 2 inches long. Spikelets broader in proportion than in vars. α and β, always more or less tinged with purple.

Var. δ has the stems 6 to 18 inches high, leaves of the barren shoots 2 to 9 inches long, very narrow and quite convolute when dry. Panicle 1½ to 4 inches long. Spikelets rather smaller than in the other varieties, more or less tinged with purple.

A very variable plant, but readily distinguished by its numerous stolons, smooth sheaths with the upper one much longer than its leaf, short subtruncate ligule, and very acute lower pale with its ribs very conspicuous when dry.

Smooth Meadow-Grass.

French, *Pâturin des prés.* German, *Wiesen-Rispengras.*

SPECIES IX.—**POA TRIVIALIS.** *Linn.*

PLATE MDCCLXXIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXII. Figs. 418 to 420.
Billot, Fl. Gall. et Germ. Exsicc. No. 2588.

Cæspitose. Rootstock not at all creeping, producing several or numerous flowering stems, and numerous short or elongate æstival barren shoots or decumbent stems, but no subterranean stolons. Flowering stem erect, curved or geniculate at the base, and sometimes rooting at the lower knots, not swollen at the base; green, the uppermost knot usually from one-third above the base to a little below the middle of the stem. Leaves linear, tapering towards the apex, gradually pointed, flat, green; sheaths rough, rarely smooth, compressed, those of the barren shoots greatly so and ancipitate, the uppermost one on the stem about twice as long as its leaf; ligule very prominent, longer than broad, lanceolate-triangular, acute. Panicle erect, equal, pyramidal or oblong-pyramidal in flower and fruit, very lax. Panicle-branches 3 to 6 at the lowest nodes of the rachis, but usually 5, the longest ones unbranched and bare of spikelets at the base for about half their length, spreading in flower and fruit or ascending in fruit, scabrous. Spikelets elliptical, 2 to 4 flowered, but usually 3-flowered. Lower glume 1-ribbed, upper one 3-ribbed. Florets connected at the base by numerous arachnoid hairs. Lower pale acute, conspicuously 5-ribbed, the midrib alone silky-hairy in the lower half, green, occasionally tinged with purple, and with narrow white scarious margins broadest towards the apex.

Var. α, *scabra.*

P. scabra, *Ehrh. D. C.* Fl. Fr. Vol. III. p. 59.

Sheaths rough.

Var. β, *Köleri.*

P. Köleri, "*D. C.* Syn. Gall. 1607.*" Test. *Gaud.* Agrost. Helv. Vol. I. p. 211.

Sheaths smooth.

In meadows, pastures, roadsides and cultivated ground; very common and generally distributed. Var. β in woods and shady places; not uncommon.

England, Scotland, Ireland. Perennial. Summer.

Stem 1 to 2 feet high. Longest leaves 3 to 9 inches by $\frac{1}{6}$ to $\frac{1}{3}$ inch broad. Panicle 3 to 9 inches long. Spikelets $\frac{1}{8}$ inch long. Florets $\frac{1}{10}$ inch long.

Very similar to P. pratensis, but usually taller and with a larger panicle, which does not droop at the apex. The leaves taper more gradually towards the apex and are less hooded; the panicle-branches are more numerous at the lower nodes of the rachis; the spikelets are smaller and fewer flowered; and the lower pale more regularly curved on the back, not distinctly acuminate, and glabrous on the margins.

Var. *α* is very readily to be distinguished from P. pratensis by its rough sheaths, but the most important characters which separate P. trivialis from P. pratensis are, the absence of a creeping root and subterranean stolons in the former and its long acute ligule.

Rough Meadow-Grass.

French, *Paturin commun.* German, *Gemeines Rispengras.*

GENUS XXXV.—**BRIZA.** *Linn.*

Spikelets stalked, arranged in a very loose open panicle, laterally compressed, open during flowering, each containing 3 to 10 perfect florets. Glumes 2, nearly equal, subrotund, concave, both shorter than the spikelets, not keeled, not awned, 7- to 9-ribbed, scarious. Pales 2, the lower one concave, rounded on the back, not keeled, cordate at the base, entire and obtuse, not awned, faintly 7- to 9-ribbed, scarious; upper pale suborbicular, truncate, 2-keeled. Lodicules 2, entire or sub-bilobed. Stamens 3. Styles 2, short, persistent; stigmas plumose, protruded at the sides of the florets between the basal margin of the pales. Caryops adherent to the upper pale, glabrous, roundish-ovate, convex on the outside, concave within.

The name of this genus is derived from the Greek word βρίθω, I balance, owing to the spikelets being suspended as from the ends of a balance.

SPECIES I.—**BRIZA MEDIA.** *Linn.*

PLATE MDCCLXXIV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXV. Fig. 429.
Billot, Fl. Gall. et Germ. Exsicc. No. 1575.

Perennial. Rootstock with very short thick slightly creeping branches terminating in short leafy barren shoots. Flowering stem solitary, simple, with persistent radical leaves. Leaves firm, linear, tapering towards the apex, flat, with rather numerous closely-placed ribs, dull glaucous green; stem-leaves shorter and narrower, the uppermost one often minute and slightly hooded at the apex; sheaths smooth, the uppermost one very slightly inflated, much longer than its leaf, frequently eight or ten times as long, and very rarely so little as twice as long ; ligule slightly prominent, generally broader than long, obtuse, rarely sub-acute, erose. Panicle erect, deltoid-pyramidal, lax, open. Panicle-branches in pairs, spreading, once or twice trichotomous, slightly scabrous. Spikelets drooping or pendulous, roundish-deltoid, compressed, 4- to 9-flowered, but usually 7-flowered. Glumes broadly oval-obovate, concave and hooded towards the apex, shorter and narrower than the lower pales of the florets contiguous to them, dull purple, rarely green, with broad white scarious margins. Lower pale quadrate-oval, concave, hooded towards the apex, slightly indurated and boat-shaped in fruit, purple, rarely green, with broad white scarious margins. Anthers purple or yellow, exserted.

In meadows, pastures, downs, and heaths. Rather common, and generally distributed in England and the south of Scotland, extending north to Ross and Lanark. It occurs in Orkney, but possibly it may have been introduced there with grass seeds. Frequent throughout Ireland.

England, Scotland, Ireland. Perennial. Summer.

Plant growing in small tufts, formed chiefly of short leafy barren shoots, produced at the extremity of the extremely short branches of the rootstock. Flowering stems 6 inches to 2 feet high, slender, slightly bent at the nodes, leafy at the base, and with 3 or 4 stem-leaves, the uppermost of which has an extremely elongated sheath; knots exposed, purplish. Radical leaves, and those on the barren shoots 1 to 8 inches long by $\frac{1}{8}$ to $\frac{1}{4}$ inch broad, very rough on the margins; uppermost stem-leaf $\frac{1}{4}$ to 3 inches long, but rarely above an inch. Panicle 1 to 6 inches long. Spikelets $\frac{1}{6}$ to $\frac{1}{4}$ inch long, and about as broad. Florets $\frac{1}{8}$ inch long.

When the pales and glumes are greenish, it is the var. pallens of French authors. ('B. lutescens, *Fouc.* Journ. Bot. III., page 211.' test. *Boreau.*) In this form the uppermost sheath often embraces the base of the panicle, but this is not always so.

Common Quaking-Grass.

French, ***Brize commune.*** **German,** ***Gemeines Zittergras.***

A beautiful grass, often gathered to form winter bouquets. Although eaten by cattle and sheep, it is of little value as a pasture grass.

SPECIES II.—**BRIZA MINOR**. *Linn.*

PLATE MDCCLXXV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXV. Figs. 428 and 430.
Billot, Fl. Gall. et Germ. Exsicc. No. 1379.

Annual. Without a rootstock. Flowering stems several or numerous, appearing in succession, simple or branched from the lower knots, without radical leaves. Leaves flaccid, very broadly linear, tapering towards both ends, flat, with rather numerous widely placed ribs, pale yellowish-green, slightly glaucous; uppermost stem-leaf smaller than the others, but in other respects similar to them; sheaths nearly smooth, the uppermost one considerably inflated and longer than its leaf, but rarely so much as twice as long; ligule very prominent, much longer than broad, oblong-lanceolate, acute or subacute, laciniate. Panicle erect, pyramidal-subspherical, lax, open. Panicle-branches in pairs, spreading, twice or thrice or four times trichotomous, scabrous. Spikelets slightly drooping, ovate-deltoid or ovate-triangular, 5- to 9-flowered, but generally 7- or 8-flowered. Glumes broadly oval-obovate, concave and almost saccate towards the apex, as long as or longer than and as broad as the lower pales of the florets contiguous to them, green, rarely purplish, with very broad white scarious margins. Lower pale suborbicular, concave, saccate towards the apex, greatly indurated, shining, and cup-shaped in fruit, green, with very broad white scarious margins. Anthers purple, included or nearly so.

In dry cultivated fields, generally among corn, rare and very local. Confined to the south-west of England, from Cornwall and Devon, or perhaps Somerset, to Hants, near Southampton and Ryde. Very rare in Ireland, where it occurs in fields at Black Rock, near Cork. Frequent in Jersey and Guernsey.

England. Ireland. Annual. Summer.

Stems 6 inches to 2 feet high, thicker but not so wiry as those of B. media. Leaves 2 to 6 inches long by $\frac{1}{2}$ to $\frac{3}{8}$ inch broad. Panicle 2 to 6 inches long. Spikelets $\frac{1}{8}$ to $\frac{1}{5}$ inch long. Florets $\frac{1}{12}$ inch long.

Readily known from B. media by its tufted flowering stems, sometimes producing short branches terminating in panicles from the lower knots; by its broader, more flaccid, and yellow-green tender leaves, the uppermost one not much smaller than the others, not hooded, and not much shorter than its sheath; by its greatly decompound panicle, and by its smaller and much more numerous and less distant spikelets, which have both the glumes and the pales broader and much more concave.

Small Quaking-Grass.

French, *Brize fluette.*

GENUS XXXVI.—**CYNOSURUS.** *Linn.*

Spikelets subsessile or very shortly stalked, disposed in pairs, one of which is fertile, the other barren and resembling a pectinated bract placed behind its fertile spikelet, unilaterally arranged in a dense continuous or slightly interrupted spike-like panicle, laterally compressed, open during flowering, each fertile one containing 2 to 5 perfect florets. Glumes of the perfect florets 2, nearly equal, strongly keeled, shorter than floret, pointed, 1-ribbed, scarious. Pales of the fertile florets 2, the lower one rounded on the back, 2-toothed, with an awn from between the teeth, 5-ribbed, the ribs all converging into the awn; upper pale 2-toothed, 2-ribbed. Lodicules 2, entire. Stamens 3. Styles 2, very short, terminal; stigmas plumose, protruded at the sides of the florets between the basal margins of the pales. Caryops usually adhering to the upper pale, glabrous, oblong-convex on the back, slightly furrowed on the inner face.

From two Greek words, κύων and οὐρα, a tail—dog's tail.

SECTION I.—EU-CYNOSURUS. *Coss. & Germ.*

Panicle linear. Sterile spikelets destitute of glumes, with the pales acuminate and mucronate. Lower pale of the fertile floret with an awn shorter than itself.

SPECIES I.—**CYNOSURUS CRISTATUS.** *Linn.*

PLATE MDCCLXXVI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLVIII. Fig. 366.
Billot, Fl. Gall. et Germ. Exsicc. No. 1383.

Perennial. Cæspitose. Rootstock with numerous short barren tufts, and several flowering stems or rarely only one. Flowering stems erect, rather rigid, leafless at the apex; uppermost knot usually below the middle of the stem. Leaves narrowly linear, tapering to the apex, rather rigid, with a few closely-placed elevated ribs, nearly smooth, bright green; sheaths smooth, the uppermost one not inflated, about twice as long as its leaf; ligule slightly prominent, broader than long, truncate, higher on one side than the other. Panicle spike-like, linear, continuous, annotinous, distichously unilateral. Panicle-branches very short, nearly equal, each having 1 to 4 pairs of spikelets, ascending, smooth. Sterile spikelets without glumes, with the pales equally distant, linear-strap-shaped, acuminate and shortly mucronate, serrulate on the keel, all empty. Fertile spikelets 3- to 5-flowered, shorter than the barren spikelets. Glumes of the fertile florets nearly equal linear-lanceolate, shortly mucronate. Lower pales of the fertile florets lanceolate, acuminate, indistinctly 2-toothed, scabrous. Awn from between the teeth of the pale, and from one-third to one-fourth of its length.

In pastures and meadows and by roadsides, very common, and universally distributed.

England, Scotland, Ireland. Perennial. Late Summer.

Plant growing in small tufts, with radical leaves 1 to 6 inches long, and flowering stems 9 inches to $2\frac{1}{2}$ feet high. Uppermost stem-leaf 1 to 3 inches long. Panicle 1 to 4 inches long by $\frac{1}{4}$ to $\frac{1}{2}$ inch broad. Barren spikelets $\frac{1}{8}$ to $\frac{1}{4}$ inch long. Fertile spikelets $\frac{1}{8}$ to $\frac{1}{5}$ inch long. Florets $\frac{1}{10}$ inch long, exclusive of the awn. Pales of both usually green, but sometimes tinged with pale purple. Anthers pale purple. Florets occasionally viviparous.

Crested Dog's-tail-Grass.

French, *Cynosure à crête*. German, *Gemeines Kammgras.*

This is a common grass in dry pastures, often forming a considerable portion of the turf on gravelly and chalky soils. It seldom grows more than 18 inches high, and in very dry situations is often not above half that size. On dry upland pastures this grass forms the principal herbage, and being relished by sheep, must be regarded as one of our most useful kinds; but upon moist land its produce is too small to recommend it for cultivation. The slender stem of this grass is valuable for making hats and bonnets, being superior to any for this purpose.

SECTION II.—PHALONA. *Dumort.*

Panicle ovoid or ovate, contracted. Sterile spikelets destitute of glumes; with the pales acuminate and longly awned. Lower pale of the fertile floret with an awn longer than itself.

SPECIES II.—**CYNOSURUS ECHINATUS.** *Linn.*

PLATE MDCCLXXVII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLVIII. Fig. 365.
Billot, Fl. Gall. et Germ. Exsicc. No. 1597.
Phalona echinata, *Dumort.* Agrost Belg. p. 114.
Chrysurus echinatus, *Pal. de Beauv.* Agrost, p. 123. *Röm. & Schultes*, Syst. Veg. Vol. II. p. 806.

Annual. Without rootstock or barren tufts. Flowering stems solitary or several and fasciculate, firm, leafy to the apex, or leafless at the apex ; uppermost knot usually above the middle of the stem. Leaves broadly linear, tapering towards the apex, flaccid, with numerous rather distant faintly-elevated ribs, rough on the margins and keel, yellowish-green; sheaths smooth, the uppermost one a little inflated, about as long as its leaf ; ligule very prominent, oblong, much longer than broad, obtuse, often higher at one side than at the other. Panicle spike-like, ovoid or oblong-ovoid, continuous, often lobed, distichously unilateral. Panicle-branches short, unequal, the lower ones usually several times dichotomous and bearing numerous spikelets, the uppermost ones or all the branches once dichotomous and bearing 2 or 4 spikelets, ascending, rough. Sterile spikelets without glumes, with the pales equally distant, lanceolate, acuminate, scabrous on the keel, with an awn about their own length, the uppermost ones sometimes containing a floret. Fertile spikelets 2- to 3-flowered, as long as the barren spikelets. Glumes of the fertile florets nearly equal, strap-shaped-lanceolate, insensibly attenuated into an awn about half their own length. Lower pales of the fertile florets elliptical-lanceolate, acuminate, deeply 2-toothed, scabrous towards the apex. Awn from between the teeth of the pale, and equalling it in length, or a little longer.

In sandy pastures. Very rare, and confined to the Channel Islands. Below Fort Regent, Jersey; near Port de Fer and other places, Guernsey. In England it is also occasionally to be met with as a casual introduction in cultivated fields sown with corn, Italian rye-grass, or clover.

Channel Islands [England]. Annual. Summer.

Stems 3 inches to 2 feet high in the Channel Islands specimens, but sometimes between 3 or 4 feet when growing in cultivated ground. Leaves 2 to 6 inches long by ¼ to ⅜ inch broad; in the cornfield specimens often much longer and broader. Panicle ½ inch to 2 inches long (or in the cultivated state sometimes 3 or 4 inches) by ⅜ to ¾ inch broad. Barren spikelets about ¼ inch long, exclusive of the awns. Fertile spikelets ¼ inch long. Florets ⅕ inch long.

Rough Dog's-tail-Grass.

French, *Cynosure hérissé.*

GENUS XXXVII.—DACTYLIS. *Linn.*

Spikelets subsessile or very shortly stalked, unilaterally disposed in a dense spike-like panicle, or in an open panicle with spike-like tufts at the end of the elongate naked branches and rachis, laterally compressed, open during flowering, each containing 8 to 11 perfect florets. Glumes 2, unequal, shorter than the spikelets, keeled, mucronate, 1- to 5-ribbed, subherbaceous. Pales 2, the lower one keeled, entire or notched at the apex, mucronate or shortly awned from immediately below the tip, with 5 or more ribs, the ribs converging into the mucro or awn. Upper pale bifid or truncate, 2-ribbed. Lodicules 2, bifid. Stamens 3. Styles 2, short or rather long; stigmas long and plůmose or short and hairy. Caryops free, glabrous, oblong or obovate, placed convex or subtregonous, with or without a furrow on the inner face.

The name of this genus is derived from δάκτυλος, a finger.

SPECIES I.—DACTYLIS GLOMERATA. *Linn.*

PLATE MDCCLXXVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLVII. Figs. 363 and 364.
Billot, Fl. Gall. et Germ. Exsicc. No. 2591.

Densely cæspitose rootstock, not creeping. Flowering stems ascending or erect. Leaves rather flaccid, broadly linear, gradually tapering to the apex, which is slightly hooded, ultimately nearly flat (in the British form), strongly keeled, with numerous broad continuous flattened slightly scabrous ribs; sheaths compressed, strongly ancipitate, scabrous and minutely pubescent, the uppermost one about as long as its leaf; ligule very prominent, triangular, acute, generally lacerate. Panicle erect or slightly drooping when in flower, distichously unilateral. Panicle-branches solitary at the lower nodes of the rachis, the lowest ones usually elongate and bare of spikelets at their base for half their length or more; the upper ones very short, all bearing unilateral clusters of spikelets towards the apex: or in small specimens the lower elongate panicle-branches wanting, and the spikelets in a compact unilateral slightly-lobed spike-like panicle. Spikelets subsessile, clustered, 2- to 5-flowered, but usually 3-flowered. Glumes slightly unequal, shorter than the florets, lanceolate, acuminate or shortly awned. Lower pale indistinctly notched at the apex, ciliated on the keel. Awn from the bottom of the notch, about one-third or one-fourth the length of the pale.

In meadows, pastures, woods, and waste places, &c. Very common and universally distributed.

England, Scotland, Ireland. Perennial. Summer, Autumn.

Stems numerous, thick, 15 inches to 3 feet high. Leaves 6 inches to 1 foot long by $\frac{1}{4}$ to $\frac{1}{2}$ inch broad, at first folded together, but afterwards nearly flat, more or less glaucous. Panicle 2 to 8 inches long or more in large specimens. Spikelets about $\frac{1}{3}$ inch long. Florets $\frac{1}{5}$ inch long, exclusive of the glumes. Lower pale green, or more or less tinged with purplish-red. Anthers generally purple, fading to brownish-orange.

In the south and west of Europe there is a small glaucous form with involute leaves and a compact semi-cylindrical panicle (D. Hispanica, *Linn.*), which may occur in the Channel Islands or south-west of England.

Rough Cock's-foot-Grass.

French, *Dactyle aggloméré.* German, *Gemeines Knaulgras.*

A very valuable agricultural grass. Horses, cattle, and sheep eat it with greediness, and fatten well in pastures in which it abounds.

GENUS XXXVIII.—**FESTUCA.** *Linn.*

Spikelets stalked or subsessile, disposed in a lax and open, or dense and contracted panicle, or in a racemose or spikelike and generally unilateral panicle, at first cylindrical, afterwards compressed, open during flowering, each containing 8 to 12 perfect florets. Glumes 2, shorter than the florets, or the larger one nearly equalling them, more or less unequal, the lower one sometimes very minute or obsolete, keeled, acuminate or acuminate-aristate, scarious or subherbaceous. Pales 2, the lower one faintly keeled or rounded on the back, entire or 2-toothed, pointed or awned, with an excurrent mid-rib, the lateral ribs vanishing below the apex, membranous or parchment-like; upper pale acute, 2-toothed, 2-ribbed, scarious. Lodicules 2, entire or 2-lobed. Stamens 3, more rarely 1 or 2. Stigmas 2, sessile or subsessile, terminal, plumose, protruded at the sides of the flower between the basal margins of the pales. Caryops generally adhering to the upper pale, glabrous, oblong, convex on the back, concave or furrowed within. Leaf-sheaths split to the base.

The name of this genus is derived from the Celtic *fest* and Latin *pascua*, signifying pasture grasses.

SECTION I.—VULPIA. *Gmel.*

Panicle contracted, often spike-like or racemose. Lower glume very much smaller than the upper one, often minute. Lower pale semi-cylindrical-subulate, faintly keeled, with a terminal awn longer than the pale. Anthers 1, 2, or 3.

Annuals, with the leaves all setaceous; ligule auricled.

SPECIES I.—**FESTUCA UNIGLUMIS.** *Soland.*

PLATE MDCCLXXIX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXXX. Fig. 291.
Billot, Fl. Gall. et Germ. Exsicc. No. 2593.
F. bromoides, "*Linn.*" *Crep.* Man. Fl. de Belg. ed. ii. p. 353. (Non *Sm.*)
Vulpia uniglumis, *Dumort.* Agrost. Belg. p. 101. *Parl.* Fl. Ital. Vol. I. p. 424. *Reich.* Ic. l. c. p. 35. *Lindl.* Syn. Brit. Fl. p. 314.
V. bromoides, *Godr.* *Gren.* & *Godr.* Fl. de Fr. Vol. III. p. 568. (Non *Link,* nec *Reich.*)
V. membranacea, *Link,* Hort. Reg. Berol. p. 147.

Annual. Without tufts of radical leaves. Stems ascending or erect from a decumbent and geniculate base, usually branched from the lower nodes. Leaves narrowly linear, channelled, ultimately convolute, with a few very broad thick raised finely-downy ribs, green; sheaths smooth, the uppermost one considerably longer than its leaf (usually more than twice as long); ligule extremely short, truncate in the middle, but produced into an auricle on each side of the base of the leaf. Panicle short, dense, semi-cylindrical, oblong, simple, racemose, distichously unilateral. Panicle-branches all reduced to pedicels bearing single spikelets. Pedicels applied to the rachis, greatly thickened upwards, mostly shorter than the spikelets. Spikelets 3- to 6-flowered erect. Glumes very unequal; lower glume very minute, often obsolete or reduced to a scale, and rarely more than one-sixth the length of the upper glume; upper glume nearly as long as the florets (exclusive of the awn), insensibly attenuated into a scabrous awn about one-fourth of its own length. Florets imbricated, not separated in fruit. Lower pale gradually attenuated into an awn exceeding its own length, at least in the lower florets, scabrous on the keel and awn, and sometimes slightly punctate-scabrous towards the apex, elsewhere glabrous. Anthers 3 (or "2" *Hook. fil.*)

On sandy seashores. Rather rare. Extending from Devon, the Isle of Wight, and Kent, north to Lancashire and Norfolk. Rare and local in Ireland, where it is confined to the east coast.

England, Ireland. Annual. Summer.

Stems 3 to 15 inches high, forming small or large tufts; in the latter case the stems are branched from the lower nodes, and these branches flower after the main stem, and never attain its height. Leaves 1 to 4 inches long, the lower ones extremely narrow, but the upper ones about $\frac{1}{12}$ inch broad, though like the other ones soon becoming convolute; uppermost sheath reaching up to the panicle when it first begins to flower, but ultimately leaving a bare portion of stem about equal to its own length between its apex and the base of the panicle. Panicle 1½ to 3½ inches long. Spikelets resembling those of Bromus Madritensis in miniature, 1 to 1½ inch long (exclusive of the awns), pale green, with white-margined pales, and purple or whitish awns.

The lower glume is very variable in size and shape; in the smallest form it is very obtuse, while when most developed it is acute or even awned. Lower pales of the lower florets slightly overlapping those of the upper florets.

Single-glumed Fescue-Grass.

French, *Fétuque uniglume.*

SPECIES II.—FESTUCA MYUROS. *Linn.*

PLATES MDCCLXXX. MDCCLXXXI. MDCCLXXXII.

Vulpia Myuros, *Parl.* Fl. Ital. Vol. I. p. 418.

Annual. Without tufts of radical leaves. Stems erect from a slightly geniculate but rarely decumbent base, simple, or branched from the lower nodes in luxuriant examples. Leaves very narrowly linear, channelled, ultimately convolute, with a few very broad thick slightly-raised downy ribs, green, the upper ones slightly glaucous; sheaths smooth, the uppermost one considerably larger than its leaf, usually about twice as long; ligule extremely short, truncate in the middle, but produced into an auricle on each side of the base of the leaf. Panicle long or short, dense or rather lax, somewhat semi-cylindrical, linear or oblong, branched towards the base or in the lower half, simple and racemose towards the apex, more or less distichously unilateral. Lower panicle branches elongate and bearing several spikelets; upper ones short and reduced to pedicels. Pedicels usually applied to the rachis and branches, thickened upwards, shorter than the spikelets. Spikelets 3- to 7-flowered, erect. Glumes unequal; lower glume always present, and from one-sixth to one-half the length of the upper one; upper glume about half as long as the contiguous florets, or rarely nearly as long, mucronate or subulate. Florets usually more or less separated in fruit, from the edges of the lower pales becoming involute. Lower pale gradually attenuated into an awn exceeding its own length, scabrous on the keel and awn, and more or less finely punctate-scabrous all over. Anther 1.

Sub-Species I.—**Festuca ambigua.** *Le Gall.*

Plate MDCCLXXX.

Bab. Eng. Suppl. Bot. No. 2970. Man. Brit. Bot. ed. ii. p. 418.
F. Myurus proper, var. ambigua. *Hook. fil.* Stud. Fl. p. 449.
F. Pseudo-myurus, var. *Lloyd*, Fl. de l'Ouest de la Fr. ed. ii. p. 589.
F. uniglumis, var. *β*, *Bromf.* Fl. Vect. p. 606.
Vulpia ambigua, *A. G. More*, Proceed. Linn. Soc. Lon. Botany, Vol. VI. p. 190.

Stems erect or ascending, decumbent and geniculate at the base. Uppermost sheath reaching nearly or quite up to the panicle. Panicle erect, occupying from one-third to one-half of the whole length of the stem, dense, continuous, fusiform-semi-cylindrical, distichously unilateral, branched towards the base only. Lowest panicle-branches from one-sixth to one-third the length of the panicle, closely adpressed. Upper glume subobtuse, mucronate, 3 to 6 times as long as the lower one, and from one-fourth to one-half the length of the contiguous floret, exclusive of the awn of the latter. Florets purplish-brown, slightly enlarged upwards after flowering. Lower pale not ciliated, punctate-scabrous.

On loose blown sand. Very local. At St. Helen's Spit, Isle of Wight (Mr. A. G. More). On the Dover, Ryde, Isle of Wight (Dr. Bromfield), in 1839, but I am informed that this station is now built upon.

England. Annual. Early Summer.

Stems numerous, 3 to 15 inches high, in luxuriant examples with branches produced from the nodes terminating in small panicles, but in weak specimens these branches are wanting. Leaves 2 to 4 inches long, very narrow, convolute, the upper ones slightly glaucous. Panicle very dense, 2 to 6 inches long by $\frac{1}{4}$ to $\frac{3}{8}$ inch broad in the middle, and tapering to each end. Spikelets 3- to 7-flowered, $\frac{1}{4}$ to $\frac{3}{8}$ inch long, exclusive of the awns, at first pale yellowish-green, but soon becoming tinged with reddish or purplish-brown. Awns pale brown. Rachis often purple.

Very similar in habit to F. uniglumis, but with the panicle tapering more towards the apex, and branched at the base, though the branches are so closely applied to the rachis that they are not visible until the plant is closely examined. The spikelets are much smaller and the awns longer in proportion; the glumes less unequal and the outer one always present, neither of them awned, and the stamen only 1.

In cultivation at Balmuto from the Isle of Wight specimens sent me by Mr. F. Stratton, the panicle becomes more slender and rather less dense, but in other respects the plant remains unaltered.

Ambiguous Fescue-Grass.

SUB-SPECIES II.—**Festuca Pseudo-myuros.** *Soyer-Willemet.*

PLATE MDCCLXXXI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXXX. Fig. 290.
Billot, Fl. Gall. et Germ. Exsicc. No. 487.
F. Myuros, *Poll.* *Sm.* Engl. Bot. ed. i. No. 1412, and Engl. Fl. Vol. I. p. 143. *Bab.* Man. Brit. Bot. ed. vi. p. 18. *Kunth*, Enum. Plant. Vol I. p. 396.
F. bromoides, var. β, *Hook. & Arn.* Brit. Fl. ed. viii. p. 557.
Vulpia Pseudo-myuros, *Reich.* Fl. Excurs. p. 37, and Ic. l. c. p. 34. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 564.
V. Myuros, *Gmel.* *Lindl.* Syn. Brit. Fl. p. 13.
V. Myuros, var. α. *Parl.* Fl. Ital. Vol. I. p. 418.

Stems erect, slightly geniculate at the base. Uppermost sheath reaching nearly or quite up to the panicle. Panicle drooping at the apex, at least in luxuriant specimens, occupying from one-half to one-third of the whole length of the stem, rather dense, tapering towards the apex, slightly interrupted below, continuous above, linear, distichously sub-unilateral, branched towards the base only. Lowest panicle-branches from one-sixth to one-third the length of the panicle. Upper glume subulate, 2 to 3 times as long as the lower one, and a little more than half the length of the contiguous floret, exclusive of the awn of the latter. Florets green, slightly enlarged upwards after flowering. Lower pale not ciliated, punctate-scabrous.

On wall-tops and on dry waste ground. Rather common, and widely distributed in England, extending from Cornwall, Dorset, Isle of Wight, and Kent, north to Chester and York. Rare in Ireland, Middleton, County Cork (the Rev. T. Albin), Fermoy, Cork, and near Holly Mount, Mayo (Cyb. Hib.)

England, Ireland. Annual. Summer.

Stems 8 to 30 inches high. Leaves 1 to 4 inches long, very narrow, soon becoming convolute and filiform, without raised ribs on the upper side, green, not glaucous. Panicle 3 inches to 1 foot long, tapering towards the apex, which is always dense and subspicate, with the pedicels very short and not conspicuously thickened upwards, and regularly distichous. Spikelets $\frac{3}{8}$ to $\frac{1}{2}$ inch long, exclusive of the awns. Awns whitish.

Distinguished from F. ambigua by its taller stems; by its longer and laxer panicle, drooping at the apex in luxuriant specimens, more interrupted towards the base, and more distichous than unilateral towards the apex; by the spikelets being less closely adpressed to the rachis; also by the glumes being less unequal and more acuminate. Still I do not feel at all confident that Mr. Lloyd and Dr. Hooker are not correct in placing F. ambigua as a variety of F. Pseudo-myuros.

Mouse-tail Fescue-Grass.

French, *Fétuque fausse queue de rat.* German, *Mäuseschwanz-Schwingel.*

SUB-SPECIES III.—**Festuca sciuroides.** *Roth.*

PLATE MDCCLXXXII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXXX. Fig. 293.
Billot, Fl. Gall. et Germ. Exsicc. No. 488.
F. bromoides, *Sm.* Engl. Bot. ed. i. No. 1411, and Engl. Fl. Vol. I. p. 142. (an *Linn.?*)
F. bromoides, var. *a*, *Hook. & Arn.* Brit. Fl. ed. viii. p. 557. *Koch,* Syn. Fl. Germ. et Helv. ed. ii. p. 937.
Vulpia sciuroides, *Gmel.* *Gren. & Godr.* Fl. de Fr. Vol. III. p. 65.
V. bromoides, *Dumort.* *Reich.* Ic. l. c. p. 35.
V. Myuros, *β*, bromoides, *Parl.* Fl. Ital. Vol I. p. 419.

Stems erect. Uppermost sheath ultimately falling far short of the base of the panicle and leaving a portion of the stem exposed at the apex. Panicle erect, rarely occupying more than one-sixth part of the whole stem, and commonly not so much, rather dense or rather lax, sometimes interrupted below, narrowly oblong, slightly distichous or unilateral, subsecund, branched usually to above the middle. Lowest panicle-branches from one-third to one-half the length of the panicle. Upper glume subulate, scarcely twice as long as the lower, and about five-sixths the length of the contiguous floret, exclusive of the awn of the latter. Florets green, rarely tinged with purplish, greatly enlarged upwards after flowering. Lower pale not ciliated, slightly punctate-scabrous or nearly smooth.

In dry pastures and waste places, by road-sides and on wall-tops. Common and generally distributed, extending north to Ross or perhaps Orkney.

England, Scotland, Ireland. Annual. Summer.

Stems usually from 6 inches to 1 foot high, but varying from 3 inches to 2½ feet. Panicle 2 to 4 inches long. Spikelets ⅜ to ½ inch long, exclusive of the awns. Florets about ¼ inch long without the awn.

Differs from F. Pseudo-myuros, to which it is very closely related, in the stems being more slender, and their upper part exserted from the uppermost leaf-sheath; in the panicle being much shorter in proportion, less contracted, with the terminal simple portion less distichous and occupying a smaller portion of the panicle; in the glumes being less unequal, and the upper one nearly as long as the contiguous floret; in the florets when in fruit being more separated, and making a greater angle with the axis of the spikelet, so that the awns diverge greatly; and in the lower pale being usually less scabrous.

Barren Fescue-Grass.

French, *Fétuque queue d'écureuil.* German, *Eichhornschwanz-Schwingel.*

SECTION II.—EU-FESTUCA.

Panicle contracted or diffuse at the time of flowering, compound. Lower glume a little smaller than the upper, but never minute. Lower pale semi-cylindrical, rounded on the back, with a terminal awn shorter than the pale. Stamens 3.

Perennial, with the lower leaves, or sometimes all the leaves, setaceous or linear, conduplicate or convolute; ligule auricled.

SPECIES III.—**FESTUCA OVINA.** *Linn.*

PLATES MDCCLXXXIII. MDCCLXXXIV.

Billot, Fl. Gall. et Germ. Exsicc. No. 2977.
F. ovina proper, *Hook. fil.* Stud. Fl. p. 448.
F. ovina, var. *a*, *Hook. & Arn.* Brit. Fl. ed. viii. p. 557.

Perennial. Densely cæspitose. Rootstock with erect branches, with very numerous tufts of radical leaves and several flowering stems, but no stolons. Flowering stems erect or ascending from the very base, slender, slightly angular, slightly rough towards the apex, with barren tufts of leaves proceeding from the lower knots at the time of flowering, so as to give the appearance of the stem being surrounded by radical leaves. Leaves all setaceous, semi-cylindrical, conduplicate, or the stem-leaves narrowly channelled, not keeled, green or glaucous; ligule obsolete, except at the margins of the leaf, where it is produced into an auricle on each side of the stem. Panicle erect, short, lax, rhombic-triangular and open in flower, linear and closed at other times, distichously unilateral. Lower panicle-branches 1 or 2 at the lower nodes of the rachis, short, ascending-spreading in flower, adpressed at other times; uppermost panicle-branches simple and reduced to short pedicels bearing single spikelets. Spikelets 2- to 5-flowered, oval. Glumes slightly unequal, lanceolate-subulate, the upper one three-fourths to one-half the length of the spikelet. Lower pale lanceolate, mucronate or with an awn shorter than itself, very narrowly scarious at the apex, smooth or more or less pubescent, particularly towards the apical margins.

Var. α, *genuina.*

PLATE MDCCLXXXIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXXXI. Figs. 294 and 296.
F. ovina, *Sibth.* *Gren. & Godr.* Fl. de Fr. Vol. III. p. 570.

Leaves all setaceous, flaccid, green, the radical ones much shorter than the flowering stem. Lower pale shortly awned.

Var. β, *tenuifolia.*

PLATE MDCCLXXXIV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXXXI. Fig. 295 and 296.
F. tenuifolia, *Sibth.* *Gren. & God.* Fl. de Fr. Vol. III. p. 570.

Leaves all setaceous, flaccid, green, the radical ones long and slender, at least half as long as the flowering stem, and often as long. Lower pale mucronate, not awned, smooth.

Spikelets often viviparous on mountains, and in Orkney at the sea-level.

Var. γ, *glauca.* Koch.

F. glauca, *Lam.* Dict. Vol. II. p. 459.

Leaves all thickly setaceous, rather rigid, often recurved, glaucous, shorter than the flowering stems. Lower pale shortly awned, smooth or pubescent.

Var. δ, *major.*

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXXXII. Fig. 303.
F. duriuscula, *Reich.* *Gren & Godr.* Fl. de Fr. Vol. III. p. 572. *Bab.* Man. Brit. Bot. ed. vi. p. 409 ?

Stem-leaves rather broader than the others. Lower pale usually shortly awned.

Stem taller, panicle and spikelets larger than in the preceding varieties.

Var. α common and generally distributed in dry pastures and on banks. Var. β chiefly in mountainous districts and in woods. Var. γ on dunes by the sea-shore or more rarely inland. Var. δ in meadows.

England, Scotland, Ireland. Perennial. Summer.

Plant growing in dense tufts, with numerous very slender leaves. Stems 3 to 15 inches high in vars. α, β, and γ, and 1 to 2 feet in var. δ. Longest leaves 3 to 6 inches, or in var. β sometimes 9 or 10 inches. Panicle in vars. α, β, γ, $\frac{3}{4}$ to $2\frac{1}{2}$ inches long, in var. δ 2 to 4 inches. Spikelets in var. α about $\frac{1}{3}$ inch long, and florets about $\frac{1}{6}$ inch; in var. β the spikelets are about $\frac{1}{6}$ inch long and florets about $\frac{1}{8}$ inch; in var. γ the spikelets are $\frac{1}{4}$ inch long, and florets about $\frac{1}{5}$

inch; in var. δ the spikelets are $\frac{1}{4}$ to $\frac{3}{8}$ inch long, and the florets $\frac{1}{5}$ inch.

Sheep's Fescue-Grass.

French, *Fétuque des brebis.* German, *Schaf Schwingel.*

SPECIES IV.—**FESTUCA RUBRA.** *Linn.*

PLATES MDCCLXXXV. MDCCLXXXVI.

Perennial. Loosely cæspitose or not cæspitose. Rootstock with horizontal branches, with rather numerous or few tufts of radical leaves and flowering stems, and short or elongate stolons. Flowering stems erect from a curved base, stout, striate, smooth or slightly rough towards the apex, without any barren tufts proceeding from its lower knots at the time of flowering, so that it does not appear to be surrounded by radical leaves. Leaves all narrowly linear or linear, conduplicate or channelled, or those of the flowering stem nearly flat, all more or less keeled, green or glaucous; ligule obsolete, except at the margins of the leaf, where it is produced into an auricle on each side of the stem. Panicle erect or slightly secundly drooping, rather long, very lax, triangular and open in flower and afterwards, or linear and closed in flower, distichously unilateral. Lower panicle-branches 2 at the lower nodes of the rachis, elongate, spreading in flower and sometimes afterwards; uppermost panicle-branches simple, and reduced to short pedicels bearing single spikelets. Spikelets 3- to 12-flowered, elliptical or oblong-elliptical. Glumes unequal, lanceolate, the upper one from half as long again to twice as long as the lower one, and one-third to one-fourth as long as the spikelet. Lower pale linear-lanceolate, mucronate or with an awn shorter than itself, very narrowly scarious at the apex, smooth or more or less pubescent.

SUB-SPECIES I.—**Festuca duriuscula.** *"Linn." Sm.*

PLATE MDCCLXXXV.

F. rubra, *Gren. & Godr.* Fl. de Fr. Vol. III. p. 574. *Parl.* Fl. Ital. Vol. I. p. 441.
F. ovina, var. β, duriuscula, *Hook. & Arn.* Brit. Fl. ed. viii. p. 557.
F. rubra, var. α, *Bab.* Man. Brit. Bot. ed. vi. p. 419.

Cæspitose or subcæspitose. Rootstock shortly creeping; stolons very short. Leaves of the barren shoots conduplicate, slender, flaccid; stem-leaves nearly flat or widely channelled, with several rather prominent ribs.

In meadows and pastures, &c. Extremely common and universally distributed.

England, Scotland, Ireland. Perennial. Summer.

Stems 9 inches to 3 feet high. Radical leaves 2 inches to 1 foot long. Panicle 2 to 7 inches long. Spikelets $\frac{1}{4}$ to $\frac{1}{2}$ inch long, usually with 5 or 6 florets, green or glaucous, often more or less tinged with purple. Florets $\frac{1}{5}$ to $\frac{1}{4}$ inch long. Lower pale smooth or more or less pubescent, sometimes terminated by an awn half its own length.

A very variable plant, but usually larger and stouter than any of the states of F. ovina, with the stem-leaves more numerous, and always either flat or widely channelled, so as to show the upper surface, which bears a few broad greatly-raised finely-pubescent ribs, but the chief point of difference is in the mode of growth.

In F. ovina the rootstock divides into numerous erect straight branches, and each of these branches is often again branched at intervals, but the branches all remain as nearly parallel as may be, the outside ones in large tufts however being pushed out of the erect into an ascending position by the pressure exerted on them by the central ones. Each ultimate branch bears numerous closely-placed leaves, of which the outermost are withered by the time of flowering. The flowering stem forms a continuation of the line of the rootstock without any curve at the base, though often with a bend at its first node above the base, and is not separated from the tufts of radical leaves by any portion clothed with leafless sheaths, or sheaths of which the laminæ have decayed.

In Festuca duriuscula the rootstock divides into short horizontal branches, produced from stolons emitted in the summer or autumn of the preceding year. These branches diverge horizontally and are clothed with sheaths which are either leafless or have the laminæ quite withered at the time of flowering, some of them terminating in barren tufts of leaves, others in flowering stems, the base in both being sharply bent round from the horizontal direction of the rootstock-branches into the vertical one of the barren tufts and flowering stems.

Under the name of Festuca duriuscula, from Continental botanists, I find about an equal number of specimens of the plant described above under that name, and of the large variety of F. ovina, previously noticed as var. major. Unfortunately "F. duriuscula" is wanting in my set of Billot's collection. Under the name "duriuscula," Koch, Grenier and Godron, and Reichenbach doubtless mean a form of F. ovina: but I am inclined to think that F. duriuscula of Fries does really represent the shortly stoloniferous plant I suppose to be F. duriuscula of Linnæus: while Fries, Koch, and Babington place the states of this F. duriuscula with longer stolons, under F. rubra.

It is of very little importance what the views of Linnæus wereas to the limits of his species of Festuca, as he had evidently not bestowed much attention to' the genus; for he confounded different species under one name and separated slight varieties as distinct species. In writing a systematic work even of the smallest pretensions (how much more then on the scale of Linnæus' writings), it will always be found that some of the sections have been more completely studied than others; and when these least-considered groups come in their turn to be described, time and opportunity are generally wanting to arrive at a satisfactory conclusion respecting them. They have to be worked out as best they can to take their place in the work, and form those weak points in it of which critics are so prone to lay hold and cry "Ex uno disce omnes."

Probably much of the alpine viviparous Festuca belongs really to F. duriuscula; but I have collected the true F. ovina viviparous in Orkney and Mull; and a non-viviparous state brought into Balmuto Garden, has this year (1871) become viviparous. Probably this is owing to the rainy summer, as I have seen Alopecurus pratensis and Cynosurus cristatus viviparous in places where I could not have failed to observe them had they been so in previous years.

F. cæsia, *Sm.* Engl. Bot. Ed. I. No. 1917, judging from the plate, is apparently a form of F. duriuscula and not of F. ovina, though doubtless Smith included under that name glaucous states of the true F. ovina.

Hard Fescue-Grass.

French, *Fétuque dure.* German, *Stärkerer Schwingel.*

SUB-SPECIES II.—**Festuca arenaria.** *Osbeck.*

PLATE MDCCLXXXVI.

Billot, Fl. Gall. et Germ. Exsicc. No. 2184.
F. subulicola, *Leon Dufour.* *Duby,* Bot. Gal. p. 517.
F. ovina, var. α, *Hook. & Arn.* Brit. Fl. ed. viii. p. 558.
F. rubra, var. arenaria, *Bab.* Man. Brit. Bot. ed. vi. p. 419. *Koch,* Syn. Fl. Germ. et Helv. ed. ii. p. 939.
F. rubra, *Sm.* Eng. Bot. ed. i. No. 2056.

Not at all cæspitose. Rootstock very extensively creeping; stolons long. Leaves of the barren shoots conduplicate, thick, firm, on short barren stems or elongate shoots; stem-leaves conduplicate, or the uppermost ones deeply channelled, with a few very thick prominent cartilaginous ribs.

On dunes and among loose sand on the sea-shore. Common and generally distributed.

England, Scotland, Ireland. Perennial. Summer.

Stems 8 inches to 2 feet high. Longest leaves 3 to 6 inches. Panicle 2 to 6 inches. Spikelets $\frac{1}{4}$ to $\frac{3}{4}$ inch. Spikelets $\frac{1}{8}$ inch, exclusive of the awn, which is rarely half the length of the pale, and sometimes wholly absent.

Very closely allied to F. duriuscula, of which many think it to be but a maritime variety. The mode of growth is the same, but the stolons, and consequently the branches of the rootstock, are so much lengthened that there is no tendency to a cæspitose habit. The leaves of the barren tufts are disposed on shoots which are usually so elongated that they appear as barren stems; they are more rigid, from the ribs being thicker and more cartilaginous, and have the two edges so closely applied that they appear rush-like; they are always more or less glaucous, which is only occasionally the case in F. duriuscula. The lower sheaths of F. rubra are always pubescent, while they are only occasionally so in F. duriuscula. The stem-leaves are more involute, the lower ones being conduplicate like those of the barren shoots, and the uppermost ones deeply channelled, with fewer, more prominent, and more hairy ribs than in F. duriuscula. The panicle is more often drooping and secund; the panicle-branches less rigid; the spikelets larger, broader, usually with more numerous florets, and always glaucous. Lower pale usually pubescent, very rarely wholly glabrous.

Creeping Fescue-Grass.

French, *Fétuque rouge.* German, *Rother Schwingel.*

SECTION III.—SCHEDONORUS. *Pal. de Beauv.*

Panicle diffuse at the time of flowering, rarely nearly simple and spike-like. Lower glume a little smaller than the upper, but never minute. Lower pale lanceolate, semi-cylindrical, rounded on the back, not awned, or with an awn at or from a little below the apex much shorter than the pale. Stamens 3.

Perennials, with all the leaves broad and flat; ligule not auricled.

SPECIES V.—FESTUCA SYLVATICA. *Vill.*

PLATES MDCCLXXXVII. MDCCLXXXVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXXX. Fig. 326.
Billot, Fl. Gall. et Germ. Exsicc. No. 887.
F. calamaria, *Sm.* Engl. Fl. Vol. I. p. 145.
Schedonorus calamarius, *Röm. & Schultes,* Syst. Veg. Vol. II. p. 701.
Poa sylvatica, *Poll.* *Parn.* Grasses of Brit. p. 99.

Cæspitose. Rootstock with very short thick creeping branches terminating in tufts of flowering and barren stems, but without stolons terminating in barren shoots. Flowering stems erect from the base, stout, smooth, leafy, with the lowermost sheaths without any lamina. Leaves all very broadly linear, flat, gradually tapering towards the apex, with very numerous slender slightly prominent rough ribs and scabrous margins, yellowish-green; sheaths rough, the uppermost one about as long or a little longer than its leaf; ligule prominent, as long as broad, laciniate. Panicle equal, lax, erect and open and pyramidal in flower, secundly drooping and closed in fruit. Lower panicle-branches 1 to 5 at each node of the rachis, but generally 3, elongated, spreading-ascending in flower, and ascending-erect in fruit, the uppermost ones shorter, but not reduced to pedicels. Spikelets 2- to 5-flowered, but usually 3- or 4-flowered, at first linear-elliptical, afterwards oval. Glumes unequal, linear, mucronate, both 1-ribbed, the lower one little more than half as long and half as broad as the upper, the upper about half as long as the spikelet and subulate. Lower pale narrowly lanceolate, longly acuminate and mucronate (almost awned), strongly 3-ribbed when dry, with the midrib excurrent, finely punctate-scabrous, scarcely scarious at the apex, pale green.

Var. α, *genuina.*

Plate MDCCLXXXVII.

F. calamaria, *Sm.* Engl. Bot. ed. i. No. 1005.

Leaves very broadly linear. Spikelets 3- to 5-flowered.

Var. β, *decidua.*

Plate MDCCLXXXVIII.

F. decidua, *Sm.* Engl. Bot. ed. i. No. 2266.

Leaves linear. Spikelets 2- to 3-flowered, usually with only one or two flowers perfect.

Whole plant smaller than in var. α.

In woods. Local and rare. Sparingly distributed from Sussex, Wilts, and Gloucester, to Banff, Elgin, and Inverness. Rare but widely distributed in Ireland. Var. β, Sussex, Westmoreland, and Ayr.

England, Scotland, Ireland. Perennial. Summer.

Plant growing in dense circular tufts, the branches of the rhizome being very short and terminating in several stems of both kinds, but without radical leaves—the lower sheaths of both barren and flowering stems being pale brown and having no laminæ. Stem 2 to 3 feet high. Longest leaves 9 inches to 1 foot long, by $\frac{1}{2}$ to $\frac{3}{4}$ inch broad in var. α; but not above $\frac{1}{4}$ inch in var. β. Panicle 3 to 7 inches long. Spikelets $\frac{1}{4}$ inch long, or in var. β $\frac{1}{5}$ inch. Florets $\frac{1}{5}$ inch long, widely separated and with the edges of the pales rolled in, so as to be nearly semi-cylindrical in fruit.

Var. β is rather a small state than a true variety, and is noticed here only because it was given as species by Smith in his earlier works.

Wood Fescue-Grass.

French, *Fétuque du Bois.* German, *Wald Schwingel.*

SPECIES VI.—FESTUCA ELATIOR. "*Linn.*" *Sm.*

PLATES MDCCLXXXIX. MDCCXC.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLI. Fig. 334.

F. arundinacea, "*Schreb.*" *Bab.* Man. Brit. Bot. ed. ii. p. 42. *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 943. *Fries*, Summ. Veg. Scand. p. 75. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 580. *Parl.* Fl. Ital. Vol. I. p. 453. *Reich.* Ic. l.c. p. 40.

Schedonorus elatior, *Röm. & Schultes*; *Lindl.* Syn. Brit. Fl. p. 313.

Bucetum elatius. *Parn.* Grasses of Brit. p. 107.

Cæspitose. Rootstock with rather short thick creeping branches terminating in tufts of flowering and barren stems, and with rather short stout stolons terminating in barren stems. Flowering stems erect from the base, very stout, smooth, leafy, with all the sheaths furnished with laminæ, but the lowest laminæ withered by the time of flowering. Leaves all very broadly linear, flat, very firm, tapering towards the apex for the last quarter of their length, with numerous thick very prominent rough ribs, and very scabrous margins, dull green above, dark shining-green below; sheaths smooth or rough, the uppermost one many (two to six) times longer than its leaf; ligule extremely short, many times broader than long, truncate, laciniate. Panicle equal, lax, more or less secundly drooping and ovate-pyramidal and open in flower, erect and closed or open in fruit. Lower panicle-branches two at each node of the rachis, each branch of the pair bearing several spikelets, but the one much longer and more branched than the other, spreading and usually arching in flower, adpressed or divaricate in fruit; the uppermost ones shorter, and a few of them solitary and reduced to pedicels bearing a single spikelet; all very scabrous. Spikelets 3- to 7-flowered, but usually 5- or 6-flowered, at first lanceolate-elliptical, afterwards oblong-elliptical. Glumes unequal, lanceolate, subacute or even mucronate, the lower one 1-ribbed, and three quarters the length of the upper, which is 3-ribbed. Lower pale broadly lanceolate, longly acuminate, acute or mucronate or shortly awned, rather strongly 5-ribbed when dry, with the midrib more often reaching the apex, or excurrent from a little below the apex, nearly smooth, or rough on the ribs and towards the apical margins, bright green, more or less tinged with reddish-purple, especially towards the apex, rather broadly white and scarious at the margins towards the apex.

Var. α, *genuina.*

PLATE MDCCLXXXIX.

F. elatior, *Sm.* Eng. Bot. ed. i. No. 1593.

Sheaths usually smooth, or the lowest ones slightly rough. Panicle closed in fruit.

Var. β, *arundinacea.*

PLATE MDCCXC.

F. arundinacea, *Schreb.* *Bab.* Man. Brit. Bot. ed. vi. p. 420.

Sheaths very rough, especially the lower ones. Panicle-branches divaricate after flowering.

Plant larger and stouter, ribs of the leaves and panicle-branches more scabrous than in var. α.

On meadows and banks by the sides of streams and near the coast, rather common and generally distributed. Var. β on wet banks and moist sand by the sea, on the south coast of England, in Devonshire, the Isle of Wight, and Kent.

England, Scotland, Ireland. Perennial. Summer, Autumn.

Var. α is a large coarse grass, growing in tufts, which rapidly increase in size, from the stout stolons extending annually considerably in advance of the flowering stems. Stems usually 3 or 4 feet high, but varying from 2 to 5 feet. Longest leaves 1 to 2 feet long by $\frac{1}{4}$ to $\frac{1}{2}$ inch broad, their margins slightly reflexed, the upper side with very numerous ribs, so that the leaf is very conspicuously striate and opaque above, but beneath is dark shining green with only the midrib prominent. Panicle 6 inches to 1 foot long, arching and contracted when it first protrudes from the uppermost sheaths then widely spreading, but still slightly drooping and with the branches all hanging over so as to be secund while in flower, lastly again closed in fruit. Spikelets about $\frac{1}{2}$ to $\frac{5}{8}$ inch long. Florets $\frac{3}{8}$ inch long. Midrib of the lower pale usually excurrent a little below the apex, in a short rough mucro or awn of variable length, but never exceeding one-sixth the length of the rest of the pale.

Var. β is a larger and rougher plant, with longer and broader leaves than var. α, and the panicle-branches remain divaricate even after flowering.

Tall Fescue-Grass.

French, *Fétuque élevée.* German, *Hoher Schwingel.*

SPECIES VII.—FESTUCA PRATENSIS. "*Huds.*" *Hook.*

PLATES MDCCXCI. MDCCXCII.

Billot, Fl. Gall. et Germ. Exsicc. No. 3270.

Loosely cæspitose. Rootstock with short slender creeping branches terminating in small tufts of flowering and barren stems or solitary flowering stems, and with very short slender stolons terminating in barren stems. Flowering stem erect from a more or less curved or geniculate base, rather slender, leafy, with all the sheaths furnished with laminæ, but the lowest laminæ frequently withered by the time of flowering. Leaves all linear or broadly linear, flat, tapering gradually from the base to the apex, with numerous rather thick, slightly prominent smooth ribs, and slightly scabrous margins, bright yellowish-green on both sides, but more shining below; sheaths smooth, the uppermost one two or three times longer than its leaf; ligule very short, several times broader than long, truncate, lacerate. Panicle lax, distichously unilateral or distichous, erect or scarcely drooping and open and narrowly triangular-oblong or linear-oblong in flower, erect and closed in fruit. Lower panicle-branches two at each node of the rachis, one branch of the pair bearing several spikelets, and the other commonly but a single spikelet, ascending in flower, erect and adpressed in fruit, the upper ones shorter, and a number of them solitary and reduced to very short pedicels bearing a single spikelet or sometimes all or nearly all solitary and reduced to very short pedicels bearing a single spikelet; all smooth or slightly scabrous. Spikelets 5- to 12-flowered, but usually 7- to 9-flowered, at first fusiform-cylindrical, afterwards linear-elliptical. Glumes slightly unequal, lanceolate, subobtuse, the lower one 1-ribbed and three-quarters the length of the upper one, which is 3-ribbed. Lower pale lanceolate-elliptical, shortly acuminate, acute or mucronate, rarely shortly awned, faintly 5-ribbed when dry, with the midrib nearly reaching the apex, or more rarely excurrent from a little below the apex; smooth or slightly rough, pale green, generally more or less tinged with purplish-brown, white and scarious at the margins towards the apex.

Var. α, *genuina.*

PLATE MDCCXCI.

F. pratensis, *Huds.* *Sm.* Engl. ed. i. No. 1592; and Engl. Fl. Vol. I. p. 147. *Gren. & Godr.* Fl. de Fr. Vol. I. p. 518. *Fries,* Summ. Veg. Scand. p. 75.
F. elatior, *Linn.* Fl. Suec. (non Spec. Plant.) *Koch,* Syn. Fl. Germ. et Helv. ed. ii. p. 943. *Parl.* Fl. Ital. Vol. I. p. 455.
Schedonorus pratensis, *Röm. & Schultes*; *Lindl.* Syn. Brit. Fl. p. 5312.
Bucetum pratense, *Parn.* Grass. of Brit. p. 105.

Panicle compound. Lower panicle branches in pairs, one branch of each pair bearing several spikelets.

Var. β, *loliacea.*

PLATE MDCCXCII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLI. Fig. 333.
F. loliacea, *Huds.* *Sm.* Engl. Bot. ed. i. p. 1821; and Engl. Fl. Vol. I. p. 146. *Koch,* Syn. Fl. Germ. et Helv. ed. ii. p. 914. *Parl.* Fl. Ital. Vol. I. p. 456.
Schedonorus loliaceus, *Röm. & Schultes*; *Lindl.* Syn. Br. Fl. p. 313.
Brachypodium loliacium, *Fries,* Mant. iii. p. 15, and Summ. Veg. Scand. p. 75.
Glyceria loliacea, *Gren. & Godr.* Fl. de Fr. Vol. III. p. 532.
Lolium festucaceum, *Link,* Hort. Berol. Vol. I. p. 273.
Bucetum loliaceum, *Parn.* Grass. Brit. p. 104.

Panicle reduced to a simple distichous spike-like raceme. Panicle branches all reduced to very short 1-flowered pedicels or rarely the lowest ones with more than 1 spikelet.

In meadows. Common and generally distributed. Var. β more local, but not rare, often intermixed with the ordinary form.

England, Scotland, Ireland. Perennial. Summer.

Stems 18 inches to 3 feet high, 7 inches long in var. α. Longest leaves 4 inches to 1 foot long in var. β, by $\frac{1}{8}$ to $\frac{1}{4}$ inch broad. Panicle 3 to 7 inches long in var. α; 5 to 10 inches long in var. β. Spikelets $\frac{1}{2}$ to $\frac{3}{4}$ inch long. Florets $\frac{3}{5}$ inch long.

In Var. β though the spike is simple or nearly so, it is usually longer, and the spikelets larger. It has the leaves also much more numerous and usually larger.

Var. α closely resembles small states of F. elatior, but it is more slender and flaccid, with shorter and narrower leaves, more tapering towards the apex, and with much slenderer and smoother ribs; the panicle is much narrower and less branched, scarcely drooping, with the panicle-branches more distichous and slightly unilateral, so that the panicle has a back and a face; the spikelets are much narrower, more parallel-sided; the florets are more separated and usually more numerous; the lower pale does not taper so much towards the apex.

Var. β cannot possibly be mistaken for F. elatior, but may readily be passed over as Lolium perenne, which it closely resembles in habit, but the spikelets are always shortly stalked, and have two glumes, and not only one as in Lolium. It might also possibly be mistaken for Glyceria fluitans, but the pales are not truncate nor 7-ribbed as in that plant.

Mr. H. C. Watson, by cultivating F. loliacea has found that it produces ordinary F. pratensis, and that in the same tuft simple and compound panicles appear. There is, however, great weight of authority for the occurrence of two plants, one a depauperised state of F. pratensis, the other a plant which Fries puts in the genus Brachypodium, and Godron in the genus Glyceria, while others consider it a hybrid between F. pratensis and Lolium perenne. It is difficult to speak from dried specimens, but if there be a plant distinct from the depauperised F. pratensis, I am unacquainted with it in the living state, though the variety above mentioned is common.

Meadow Fescue-Grass.

GENUS XXXIX.—**BROMUS.** *Linn.*

Spikelets stalked or rarely subsessile, disposed in a lax and open or dense and contracted panicle, at first cylindrical, afterwards laterally compressed, open during flowering, with 4 to 15 perfect florets. Glumes 2, shorter than the florets, unequal, or nearly equal concave or keeled, pointed or mucronate, subherbaceous. Pales 2, the lower one keeled or rounded on the back, bifid or 2-toothed, almost always awned from a little below the apex, 2 of the lateral ribs, as well as the midrib, usually running into the awn, very rarely without any awn, subherbaceous; upper pale entire or 2-toothed, 2-ribbed, scarious. Lodicules 2, entire. Stamens 3, very rarely 2 or 1. Stigmas 2, sessile, almost always inserted below the summit of the ovary, plumose, protruded between the sides of the florets between the basal margins of the pales. Caryops adherent to the upper pale, glabrous, but almost always downy at the apex, oblong-convex on the back, deeply furrowed on the inner face.

Leaf-sheaths usually split at or towards the apex only.

The name of this genus is derived from the Greek word, βρῶμα, food.

SECTION I.—FESTUCARIA. *Gren. & Godr.*

Spikelets not enlarged towards the apex except during the time of flowering. Florets usually widely open during the time of flowering. Lower pale lanceolate, semi-cylindrical, rounded on the back, with an awn shorter than itself, or very rarely longer, or sometimes absent.

Perennials.

SPECIES I.—**BROMUS GIGANTEUS.** *Linn.*

PLATES MDCCXCIII. MDCCXCIV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLV. Fig. 358.
Billot, Fl. Gall. et Germ. Exsicc. No. 888.
Festuca gigantea, *Villars*; *Bab.* Man. Brit. Bot. ed. vi. p. 419; et *Auct. Plur.*
Bucetum giganteum, *Parnell*, Grass. of Brit. p. 108.

Perennial. Rather loosely cæspitose. Rootstock not creeping or stoloniferous, producing several tall flowering and short barren stems. Flowering stems stout. Leaves flaccid, very broadly linear, gradually tapering from a little above the base to the apex, very acute, flat, with very numerous slender unequally raised slightly scabrous ribs, and very scabrous margins, very finely scabrous-puberulent between the ribs, bright green; sheaths split to the base, sulcate, nearly smooth, or the lower ones scabrous, often puberulent, the uppermost one about as long as its leaf; ligule slightly prominent, broader than long, truncate, lacerate, higher on one side than on the other. Panicle secundly drooping, large, lax, open and semi-pyramidal in flower and fruit. Rachis with distant nodes, scabrous. Panicle-branches 2 at the lower nodes of the rachis, the longer ones unbranched and bare of florets at the base for about half their length, arching-spreading in flower, scabrous. Spikelets applied to the branches of the panicle, lanceolate-subcylindrical before flowering, afterwards oblong-elliptical or oblong-lanceolate and compressed, 3- to 9-flowered. Glumes lanceolate, acute, not awned, broadly scarious on the margins, the upper a little longer than the lower and with 3 prominent ribs, the lower with 1 rib. Florets slightly open during the time of flowering. Lower pale elliptical-lanceolate, acuminate, bidentate, with rather broad scarious margins and apices, with 3 to 5 faint scabrous ribs towards the apex. Awn from the bottom of the notch of the pale, erect, usually from once and a half to twice as long as the pale, more rarely only as long as the pale. Ovary glabrous at the apex. Stigmas springing from the apex of the ovary.

Var. α, *genuinus.*

PLATE MDCCXCIII.

B. giganteus, *Linn.* Spec. Plant. p. 114.
Festuca gigantea, *Sm.* Engl. Bot. ed. i. No. 1820.

Spikelets 5- to 9-flowered.

Var. β, *triflorus.*

PLATE MDCCXCIV.

B. triflorus, *Linn.* Spec. Plant. p. 115.
Festuca triflora, *Sm.* Engl. Bot. ed. i. No. 1918.

Spikelets 3- or 4-flowered.

Plant smaller, leaves narrower, panicle less drooping and less secund, and spikelets more lanceolate than in var. α.

In woods and in hedges. Rather common and generally distributed in England, more rare and local in Scotland, though extending as far north as Argyle and Elgin. Frequent throughout Ireland. Var. β not rare.

England, Scotland, Ireland. Perennial. Summer, Autumn.

Stems 2 to 4 feet high or more. Longest leaves 9 to 18 inches long, by ½ to ¾ broad, the uppermost and lowermost shorter and narrower than those on the middle of the stem, all awned at the base. Panicle 9 inches to 1 foot long or more. Spikelets pale green, 3 to ⅝ inch long, exclusive of the awns.

Var. β is little more than a smaller state of the plant, and it is difficult to draw any line between it and var. α.

This plant is intermediate in its characters between Festuca and Bromus. It has the habit and awn of the latter, but the glabrous ovary and terminal styles of the Festucæ, and the inner pale is less ciliated on the ribs than in Bromus. I have retained the plant in the genus Bromus, in which Linnæus placed it, on account of its extreme similarity to Bromus asper, and unlikeness to any of the true Festucæ.

Tall Brome-Grass.

French, *Fétuque élancée.* German, *Riesen Schwingel.*

SPECIES II.—**BROMUS ASPER.** *Murray.*

PLATE MDCCXCV.

B. ramosus, *Huds.* Fl. Angl. ed. i. p. 40 (non *Linn*).
Schedonorus asper, *Fries*, Summ. Veg. Scand. p. 76.

Perennial. Rather loosely cæspitose. Rootstock not creeping or stoloniferous, producing several tall flowering or short barren stems. Flowering stems stout. Leaves flaccid, arching, very broadly linear, gradually tapering from a little below the middle to the apex, very acute, flat, with very numerous broad unequally raised slightly rough and hairy ribs, and scabrous margins, bright green; sheaths split at the apex, but not half way down, sulcate, hirsute with long spreading-reflexed hairs, the uppermost one shorter than its leaf, and sometimes subglabrous; ligule prominent, longer than broad, lacerate, equal. Panicle secundly drooping, very large, lax, open and semi-pyramidal in flower and fruit. Rachis with distant nodes, pubescent. Panicle-branches 2 to 5 at the lower nodes of the rachis, the longer ones unbranched and bare of florets at the base for about half their length, arching-spreading in flower, scabrous. Spikelets drooping, linear-fusiform-cylindrical before flowering, afterwards wedge-shaped-oblong and compressed, ultimately oblong 5- to 9-flowered. Glumes lanceolate, acute, not awned, broadly scarious on the margins, the upper one-third longer than the lower (or sometimes not much larger) and with 3 prominent ribs, the lower one with 1 rib. Florets widely open during the time of flowering. Lower pale oblong-lanceolate, acuminate, deeply bidentate, with rather broad scarious margins and apices, with 3 faint pubescent ribs, slightly scabrous towards the apex. Awn from the bottom of the notch of the pale, usually from one-half as long to as long as the pale, more rarely not longer than half the pale. Ovary woolly at the apex. Stigma springing from a little below the apex of the ovary.

Var. β, *serotinus.*

PLATE MDCCXCV.

B. serotinus, *Beneken.* Bot. Zeit. 1845, p. 724. *Garcke,* Fl. v. Nord- & Mittel-Deutschz. ed. vi. p. 459.

Sheaths all with spreading-reflexed hairs. Panicle-branches mostly 2 at the lower nodes of the rachis (at least in the wild state), each of them bearing several spikelets. Glumes unequal. Pales nearly glabrous on each side of the midrib.

? Var. β, *Benekenii.*

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLV. Fig. 357.
Billot, Fl. Gall. et Germ. Exsicc. No. 887.
B. asper, *Beneken*; *Garcke,* l. c. p. 459.

Upper sheaths subglabrous. Panicle-branches 3 to 6 at the lower nodes of the rachis, 1 of the branches bearing but a single spikelet. Glumes nearly equal. Pales hairy all over.

Stems shorter and leaves narrower, and flowers said to be produced two or three weeks earlier than in var. α.

In woods and hedge-banks. Rather common and generally distributed in England and the south of Scotland, extending north to

Argyle and Elgin. Frequent and generally distributed in Ireland. Var. β doubtfully indigenous. "Near the 'Plough,' Camberwell," "in Sowerby's herbarium." (*Dr. Trimen*, 'Journ. Bot.' 1870, p. 378); Kensington Gardens! (*Hon. J. L. Warren*, 'Journ. Bot.' 1871, p. 238).

England, Scotland, Ireland. Perennial. Summer, Autumn.

A robust grass, with the stems 2 to 6 feet high. Longest leaves 9 inches to 2 feet by ½ to 1 inch broad. Panicle 9 to 18 inches long or more. Spikelets ¾ to 1 inch long, exclusive of the awns. Florets ½ inch long, exclusive of the awns.

Sometimes confused by young botanists with B. giganteus, but the leaves are more hairy, and the sheaths, or at least the lower ones, with long spreading-reflexed hairs; the panicles and spikelets are more drooping; the spikelets longer, with shorter awns; the ovary is hairy at the apex, and the stigmas are not terminal.

The only form that is certainly wild in Britain, so far as is yet known, is the B. serotinus of Beneken.

At Aberdour, on the Fife coast, B. asper is very abundant, with the lower branches of the panicle in pairs. In 1869 I brought a plant from this locality into Balmuto Garden, which has now (July 1871) developed its panicle. I have before me two stems taken from that root. In one of these there are 3 branches at each of the lower nodes of the panicle, and in the other 4 branches. These, however, are all elongate, none of them bearing but a single spikelet as in the plant figured by Reichenbach and distributed by Billot as Bromus asper. The number of branches of the panicle at each node of the rachis is a character of but little importance. In specimens from Lyons, collected by M. Jordan the panicle-branches are in pairs and upper sheaths glabrous. Neither is the pubescence of the pales to be depended on in the genus Bromus. All the characters taken together, however, are perhaps sufficient to entitle it to be considered a sub-species; but this cultivation alone can determine.

Dr. Trimen, in "Journ. Bot.," Sept. 1870, wishes to substitute the name Bromus ramosus of Hudson's first edition of the "Flora Anglica" for the commonly-received one of Bromus asper. Hudson withdrew his name "ramosus" in the second edition, so that in this case as well as in that of Aira setacea, Dr. Trimen, fortunately for botanical science, is not likely to be able to disturb generally accepted nomenclature.

Rough Brome-Grass.

French, *Brome rude.* German, *Rauhaarige Trespe.*

SPECIES III.—**BROMUS ERECTUS.** *Huds.*

PLATE MDCCXCVI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLVI. Fig. 360.
Billot, Fl. Gall. et Germ. Exsicc. No. 1093.
Schedonorus erectus, *Fries*, Summ. Veg. Scand. p. 76.

Perennial. Very densely cæspitose. Rootstock shortly creeping, but not stoloniferous, each branch ending in tufts of several flowering stems and barren shoots or short barren stems. Flowering stems rather stout, wiry. Leaves rigid, very narrowly linear, the radical ones and those of the barren shoots conduplicate, ciliated; those of the stem broader, flat or widely channelled, glabrous, all dark green; sheaths split only at the apex, deeply striate, usually pilose with distant spreading-ascending hairs, or nearly glabrous, the uppermost one about as long as its leaf; ligule short, broader than long, truncate. Panicle erect, nearly simple, rather small, dense, contracted, oblong in flower and fruit. Rachis with rather distant nodes, glabrous or slightly scabrous. Panicle-branches 2 to 5 at the lower nodes of the rachis, most of them bearing only a single spikelet, not more than 2 at each node bearing 2 or 3 spikelets, these being bare of spikelets and unbranched for about half their length, nearly erect in flower and fruit, slightly scabrous. Spikelets erect, linear-fusiform-cylindrical before flowering, afterwards oblong and compressed, 4- to 12-flowered. Glumes lanceolate, with subulate points, very acute, but not awned, narrowly scabrous on the margins, the upper one about one-sixth longer than the lower, and with 3 prominent ribs, the lower one with 1 rib. Florets widely open during the time of flowering, Lower pale oblong-lanceolate, acuminate, shortly bidentate, with rather narrow scarious margins and apices, with 5 or 7 rather faint scabrous-pubescent ribs. Awn from the bottom of the notch of the pale, about one half of the length of the pale. Ovary woolly at the apex. Stigma springing from a little below the apex of the ovary.

Var. α, *genuinus*.

Lower pale glabrous or nearly so, except on the ribs.

Var. β, *villosus*.

Lower pale hairy all over.

On dry banks and pastures and by road-sides, in chalky and sandy soils. Not unfrequent in the south and east of England, but rare in the north and west. Doubtfully native in Scotland, though it has been found in New Abbey Churchyard, Kirkcudbright, below Salisbury Craigs, Edinburgh, and near Pettycur and Dunfermline, Fife. Rare in Ireland, but occurring in Counties Cork and Galway, and near Dublin. Var. β. Combe Hay, near Bath (Mr. T. Dutton).

England, Scotland (?), Ireland. Perennial. Summer.

Stems 18 inches to 3 feet high or more, with their bases enclosed in decayed leaf-sheaths. Longest leaves 6 inches to 1 foot long or more; stem-leaves shorter and broader, $\frac{1}{8}$ to $\frac{1}{6}$ inch broad. Panicle $2\frac{1}{2}$ to 6 inches long. Spikelets $\frac{3}{4}$ to $1\frac{1}{4}$ inch long, exclusive of the awn. Florets $\frac{1}{2}$ to $\frac{3}{5}$ inch long. Spikelets prettily variegated with green, pale red or purple, and white, somewhat like those of Avena pratensis and pubescens. Anthers reddish-purple.

Upright-perennial Brome-Grass.

French, *Brome dressé.* German, *Aufrechte Trespe.*

SECTION II.—EU-BROMUS. *Gren. & Godr.*

Spikelets enlarged towards the apex during and after flowering. Florets scarcely open during flowering. Lower pale subulate, semi-cylindrical, keeled, with an awn exceeding its length, usually very greatly so. Stamens 2 or 3, rarely 1.

Biennials or annuals.

SPECIES IV.—**BROMUS MADRITENSIS.** *Linn.*

PLATE MDCCXCVII.

Billot, Fl. Gall. et Germ. Exsicc. No. 1098.
B. diandrus, *Curt.* *Bab.* Man. Brit. Bot. ed. vi. p. 421. *Sm.* Engl. Bot. ed. i. No. 1006; and Engl. Fl. Vol. I. p. 160.
B. polystachyus, *D.C.* Fl. Fr. Vol. V. p. 276.

Biennial or Annual. Stems rather slender, erect from a more or less geniculate or curved base. Leaves narrowly linear, more or less pubescent, or the uppermost one glabrous; sheaths split half way down, cylindrical, pubescent, or one or two of the upper ones glabrous; ligule prominent, about as long again as broad, lanceolate. Panicle erect, rather small, nearly simple, dense or rather dense, contracted. Rachis with approximate or rather approximate nodes, faintly scabrous or pubescent. Panicle-branches 2 to 6 at the lower nodes of the rachis, rarely bearing more than a single spikelet, sometimes 1 or 2 of them with 2 or 3 spikelets, and mostly all shorter than the spikelets (exclusive of the awns), suberect in flower and fruit, slightly scabrous or pubescent. Spikelets erect, linear-elliptical before flowering, oblong and enlarged upwards during flowering, and inversely triangular with concave sides in fruit, 5- to 15-flowered. Glumes subulate, very acute, but not awned, broadly scarious on the margins, the upper one about thrice as long as the lower, and with 3 prominent ribs, the lower with 1 rib. Florets distinct, diverging and slightly curved outwards in fruit. Lower pale linear-lanceolate-subulate, deeply bidentate, with 2 long apical teeth about one-sixth the length of the pale, with rather broad scarious margins and apices, with 7 rather faint ribs, of which the two marginal ones are contiguous, finely punctate-scabrous, or more rarely pubescent. Awn from the bottom of the notch of the pale, about as long as the pale, straight in flower, curved outwards in fruit. Stamens 2, more rarely 1 or 3.

Var. α, *Curtisii*. Bab.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLII. Fig. 342.
B. Madritensis, *Röm. & Schultes*, Syst. Veg. Vol. II. p. 648. *Reich.* Ic. l. c. p. 41.

Panicle oblong, rather dense. Rachis and panicle-branches slightly scabrous, not pubescent. Glumes and pales minutely punctate-scabrous, but not pubescent.

Var. β, *rigidus*. Bab.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLII. Fig. 341.
B. rigidus, "*Roth*;" *Röm. & Schultes*, Syst. Veg. Vol. II. p. 651. *Reich.* Ic. l.c. p. 41. (non *Koch*).

Panicle very dense, inversely deltoid. Rachis and panicle-branches minutely pubescent, the latter very short. Glumes and pales pubescent with long close hairs.

On sandy banks and dry waste places, and on wall-tops. Local and confined to the south of England, from Devon, mainland Hants, and Kent; to Pembroke, Carmarthen, Glamorgan, and Gloucester, and formerly near Battersea, Surrey. As a casual it has been found in several counties as far north as Durham. Tipperary, Ireland, probably not native. Var. β, Jersey, Guernsey, and Sark, also as a casual on the ballast-hills on the coast of Fife.

England, [Ireland]? Annual or Biennial. Summer.

Stems 4 inches to 2 feet high. Longest leaves 1 to 4 inches by $\frac{1}{8}$

inch broad. Panicle 2 to 5 inches long. Spikelets 1 to 1½, exclusive of the awns. Florets about ½ inch, exclusive of the awn.

In var. β the panicle, in the specimens I have seen, is not above 1½ to 2 inches, exclusive of the awns, and the panicle-branches are much shorter and fewer. Possibly it ought to be considered a distinct subspecies, but I have never seen it alive, though I have looked carefully for it both in Jersey and Guernsey. In habit it approaches B. fasciculatus. *Presl.*

Upright-annual Brome-Grass.

SPECIES V.—BROMUS MAXIMUS. *Desv.*

PLATE MDCCXCVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLII. Fig. 338.
Billot, Fl. Gall. et Germ. Exsicc.
B. rigidus, *Koch*? Fl. Germ. et Helv. ed. ii. p. 949. *Lloyd*, Fl. de l'Ouest de la Fr. ed. ii. p. 598. (non *Roth*).
B. ambigens, *Jord.* in *Billot*, Annot. p. 229.

Biennial or annual ? Stems stout, ascending from a more or less geniculate or curved base. Leaves rather broadly linear, more or less pubescent; sheaths split half way down, cylindrical, pubescent; ligule prominent, about as long as broad, lacerate. Panicle at first suberect, afterwards more or less secundly drooping, rather large, nearly simple, rather dense and contracted, or lax and open at least in flower. Rachis with distant nodes, rather thinly setosely-pubescent (or in Continental forms densely pubescent). Panicle-branches 2 to 6 at the lower nodes of the rachis, rarely bearing more than a single spikelet, sometimes 1 or 2 of them with 2 or 3 spikelets, and (in the Jersey plant) most of them shorter than the spikelets, or several of them as long as the spikelets (exclusive of their awn), ascending-spreading or spreading in flower and fruit, or suberect in fruit, more or less setosely-pubescent like the rachis. Spikelets erect or slightly drooping, linear-elliptical before flowering, oblong and enlarged upwards during flowering, and ultimately oblong-wedge-shaped, with straight sides, 4- to 12-flowered. Glumes lanceolate-subulate, very acute, almost awned, broadly scarious on the margins, the upper one one-fourth to one-third longer than the lower and 3-ribbed, the lower one 1- or 3-ribbed. Florets slightly overlapping, not diverging or at all curved outwards in fruit. Lower pale linear-lanceolate-subulate, deeply bidentate, with 2 long apical teeth about one-eighth the length of the pale, with broad scarious margins and apices, with 7 rather prominent and nearly equidistant ribs, scabrous-pubescent. Awn from the bottom of the notch of the pale, longer than the pale (usually from half as long again to twice as long), straight in flower and fruit. Stamens 2, more rarely 3.

In sandy places and by road-sides. Very local. Abundant on the Quenvais, more sparingly in St. Aubin's Bay, and at St. Clement's Jersey.

Channel Islands. Biennial or Annual. Early Summer.

The Jersey plant has the stems 1 to 2 feet high. Leaves 2 to 6 inches long, by ⅛ to ¼ inch broad. Panicle rather dense, 3 to 8 inches long. Spikelets green, 1 to 1½ inches long, exclusive of the awns. The florets about ¾ inch long. Awns 1½ to 2 inches long. Pedicels of the lateral spikelets much shorter than the spikelets.

Readily distinguished from B. Madritensis by its more lax and usually slightly secundly-drooping panicle, with much larger spikelets, which have their florets less separated in fruit and not at all curved; the awns, also, are longer in proportion and never at all curved outwards in fruit, so that the fruiting spikelets are regularly wedge-shaped, with straight sides, in B. maximus: while in B. Madritensis they are much wider at the apex and have concave sides.

The Jersey plant belongs to a group of varieties or subspecies (I do not venture to say which) included under the name B. maximus. Our plant appears to be precisely the B. rigidus, var. α, of Lloyd, the B. maximus, var. α minor, of Grenier & Godron, and the B. ambigens of Jordan. B. rigidus of Roth and Reichenbach is a distinct plant, doubtless the pubescent state of B. Madritensis.

Great Brome-Grass.

SPECIES VI.—**BROMUS STERILIS.** *Linn.*

PLATE MDCCXCIX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLII. Fig. 339.
Billot, Fl. Gall. et Germ. Exsicc. No. 1095.
Schedonorus sterilis, *Fries,* Summ. Veg. Scand. p. 76.

Biennial or annual? Stems rather stout, ascending or erect from a more or less geniculate or curved base. Leaves rather broadly linear, more or less pubescent; sheaths split not more than one-third of the way down, cylindrical, minutely pubescent or subglabrous, the uppermost one often wholly glabrous; ligule prominent, about as long as broad, lacerate. Panicle secundly drooping in flower and fruit, large, nearly simple, very lax and open. Rachis with distant nodes, slightly scabrous, but not pubescent. Panicle-branches 2 to 6 at the lower nodes of the rachis, rarely bearing more than a single spikelet, sometimes 1 or 2 of them with 2 or 3 (rarely 4) spikelets, most of them much longer than the spikelets (exclusive of their awns), arching-reflexed in flower and fruit, finely setosely-scabrous. Spikelets drooping, linear-elliptical before flowering, oblong and enlarged upwards during flowering, and ultimately oblong-wedge-shaped, with straight sides, 4- to 10-flowered. Glumes lanceolate-subulate, very acute, but not awned, broadly scarious on the margins, the upper one twice as long as the lower and strongly 3-ribbed, the lower one 1-ribbed. Florets scarcely overlapping, but not diverging or at all curved outwards in fruit. Lower pale linear-lanceolate-subulate, deeply bidentate, with 2 long apical teeth about one-tenth the length of the pale, with broad scarious margins and apices, with 7 prominent and nearly equidistant ribs, scabrous-puberulent. Awn from the bottom of the notch of the pale, a little longer than the pale, usually about one-fourth longer, straight in flower and fruit. Stamens 3.

In dry places, especially by road-sides. Frequent in England and the south of Scotland, but rather rare, or at least local, north of the Forth and Clyde, though extending to Elgin, Banff, and the neighbourhood of Glasgow. Local, but widely distributed, in Ireland.

England, Scotland, Ireland. Biennial or Annual. Summer.

Stem 18 inches to 3 feet high. Longest leaves 3 to 8 inches long, by $\frac{1}{8}$ to $\frac{1}{4}$ inch broad. Panicle 6 to 10 inches long. Spikelets $\frac{3}{4}$ to $1\frac{1}{4}$ inch long, exclusive of the awns. Florets $\frac{1}{2}$ to $\frac{5}{8}$ inch long, exclusive of the awn. Awns $\frac{3}{4}$ to 1 inch long. Pedicels of the lateral spikelets nearly as long as the spikelets.

B. sterilis has much the aspect of the large open-panicled forms of B. maximus, such as B. Boræi of Jordan, but the panicle is much more lax, the branches more capillary, longer, and greatly arching-drooping; the rachis not at all pubescent; the spikelets smaller, green or purple, with the awns shorter in proportion; glumes more unequal.

Both B. maximus and B. sterilis are ordinarily biennial, but occasionally plants of each may be found flowering in autumn—probably produced from the earlier ripened seeds of the same year, or else from seeds which have remained dormant in the ground until the spring.

Barren Brome-Grass.

French, *Brome stérile.* German, *Taube Trespe.*

SECTION. III.—SERRAFALCUS. *Parl.*

Spikelets not enlarged towards the apex during flowering, broadest rather below the middle. Lower pale elliptical or oval, concave, rounded on the back, with an awn usually shorter than itself, or sometimes absent.

Biennials or perennials.

SPECIES VII.—**BROMUS SECALINUS.** *Linn.*

PLATES MDCCC. MDCCCI.

Serrafalcus secalinus, *Bab.* Man. Brit. Bot. ed. vi. p. 421. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 588. *Parl.* Fl. Ital. Vol. I. p. 338.

Biennial or annual. Stem nearly glabrous, except on the knots. Leaves thinly pubescent, deep green; sheaths split at the apex only, glabrous, or pubescent with very short reflexed hairs. Panicle erect in flower, and (especially in luxuriant examples) more or less secundly-drooping in fruit, simple or slightly branched, rather lax. Rachis with distant nodes. Panicle-branches 3 to 6 (rarely only 2) at the lower nodes of the rachis, unequal, a few of the longest with from 2 to 5 spikelets, unbranched and bare of spikelets for half their length, not more than the length of 2 internodes, the shortest and those in the upper part of the panicle reduced to pedicels, scabrous or hispid-pubescent, ascending-erect in flower, arching-ascending in fruit. Pedicels longer than or about as long as their spikelets. Spikelets erect in flower, drooping in fruit, at first elliptical-lanceolate and acute, ultimately oval-ovate and sub-obtuse, 5- to 15-flowered, green. Glumes unequal, the inner or larger one extending half way to the apex of the third floret.* Florets imbricated in flower, but separate in fruit, from the margins of the lower pales becoming involute. Lower pale with the margins regularly curved from the base to the apex, 5-ribbed, notched at the apex, glabrous or pubescent, with narrow scarious margins. Awn from the bottom of the notch of the pale, straight or flexuous, very rarely bent outwards, varying from a mere mucro to as long as the pale. Upper pale as long as the lower.

Var. α, *genuinus.*

PLATE MDCCC.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXCIV. Fig. 353.
Billot, Fl. Gall. et Germ. Exsicc. No. 1093.
B. secalinus, *Schrad.* *Sm.* Engl. Bot. ed. i. No. 1171, and Engl. Fl. Vol. I. p. 154.

Sheaths glabrous, or nearly so. Panicle-branches scabrous. Spikelets glabrous. Awns erect.

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* i.e. the second floret on the side opposite to it.

Var. β, *velutinus.*

PLATE MDCCCI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXCIV. Fig. 350.
Billot, Fl. Gall. et Germ. Exsicc. No. 185.
B. velutinus, *Schrad.* *Sm.* Engl. Fl. Vol. I. p. 159.
B. multiflorus. *Sm.* Engl. Bot. ed. i. No. 1884.

Sheaths pubescent with short hairs. Panicle-branches hispid-pubescent. Spikelets finely pubescent. Awns erect.

In cultivated fields, and occasionally by roadsides. Rather scarce. Generally but thinly distributed throughout England, but not persistent in its stations. Imperfectly naturalised in Scotland, though it has been found as far north as Ross and Isla. Uncertain in its appearance, and ill-established in Ireland, though extending from north to south. Var. β. is more rare and less thoroughly established in England than var. α.; it appears to be most frequent in the Metropolitan counties.

England [Scotland] [Ireland]. Biennial or annual (?).
Summer, Autumn.

Stems 1 to 2 feet high, or more. Leaves 2 to 8 inches long, by $\frac{1}{4}$ to $\frac{1}{2}$ inch broad. Panicle 2 to 10 inches long. Spikelets $\frac{1}{4}$ to 1 inch long, exclusive of the awns. Florets $\frac{1}{4}$ to $\frac{5}{12}$ inch long.

Readily distinguishable from all its allies occurring in Britain by the florets being completely separated from each other when in fruit.

Many authors divide this species into two varieties according to the size of the spikelets; the type being the form with smaller spikelets, whether they be glabrous or pubescent; the second form, Bromus grossus, *D. C.*, being that with larger spikelets, and with the florets more separated in fruit on account of the margins of the lower pale extending beyond the caryops, and consequently becoming more involute.

Reichenbach figures a variety *divergens*, in which the awns are as much bent outwards as in B. patulus, but I am not aware of the occurrence of this form in Britain.

Rye Brome-Grass.

French, *Serrafalcus Seigle.* German, *Roggen Trespe.*

SPECIES VIII.—BROMUS RACEMOSUS. *'Linn.' Hook. fil.*

PLATES MDCCCII. MDCCCIII.

Biennial. Stem erect or ascending, faintly puberulent, more pubescent on the knots. Leaves thinly pubescent, deep green; sheaths split at the apex only, pubescent with short or long reflexed hairs. Panicle erect or secundly drooping in flower and fruit, simple or rarely slightly branched, lax in flower, contracted in fruit. Rachis with rather distant nodes. Panicle-branches 2 to 3 at the lower nodes of the rachis, unequal, all reduced to pedicels, or a few of the longest ones at the lower nodes with from 2 to 3 spikelets, unbranched and bare of spikelets for half their length, not more than the length of two internodes, the shortest of the lower ones and all those in the upper part of the panicle reduced to pedicels, scabrous. Longest pedicels longer than or about equal to their spikelets, the upper ones usually shorter than the spikelets. Spikelets erect or drooping in flower and fruit, at first oval-lanceolate or lanceolate, ultimately oval- or oblong-lanceolate, always acute, 4- to 10-flowered, green or more or less tinged with brownish-purple. Glumes unequal, the inner or largest one extending half way to the apex of the fourth floret.* Florets closely imbricated in flower and fruit. Lower pale, regularly curved on the margins from the base to the apex, or with a very obtuse angle a little beyond the middle on each side, 5-ribbed, notched at the apex, glabrous or puberulent, rarely pubescent, with narrow scarious margins. Awn from the bottom of the notch of the pale, straight and erect, as long as, or a little longer, than the pale. Upper pale a little shorter than the lower.

SUB-SPECIES I.—**Bromus eu-racemosus.**

PLATE MDCCCIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLIII. Fig. 348.
Billot, Fl. Gall. et Germ. Exsicc. 2185.
B. racemosus, *Fries*, Mant. III. p. 10, and Summ. Veg. Scand. p. 76. *Sm.* Engl. Bot. ed. i. No. 1070. *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 946.
Serrafalcus racemosus, *Parl.* Fl. Ital. Vol. I. p. 391. *Bab.* Fl. Camb. p. 308, & Man. Brit. Bot. ed. vi. p. 422. *Gren.* Fl. du Jure, p. 922.

Panicle erect in flower and fruit. Panicle-branches all rarely more than 1-flowered, the upper ones much shorter than their spikelets. Spikelets ultimately oval-lanceolate, acute. Lower pale uniformly curved on the margins from the base to the apex. "Anthers four times as long as broad." (Bab.)

In meadows and damp pastures. Said to be not uncommon, but I myself have seen specimens from no other localities than the Isle of Wight, Surrey, Middlesex, and Cheshire, though there is sufficient authority for its occurrence in Cambridge and Beds; the Rev. W. W.

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* i.e. the second on the same side of spikelets.

Newbould tells me he believes it is abundant in Essex, and probably occurs in Herts. I have a specimen from Alloa, Clackmannanshire, collected by Dr. Carrington. In the "Cybele Hibernica," it is said to be not unfrequent in Ireland.

England, Scotland, Ireland. Biennial. Summer.

Stems 18 inches to 3 feet high, erect. Leaves 2 to 6 inches long, and about ¼ inch broad. Panicle 2 to 6 inches long. Spikelets ½ to ¾ inch long, green, always glabrous. Florets ¼ inch long, exclusive of the awns. Awns long, purple.

A much slenderer and often a taller plant than B. secalinus, with smaller and more acute fructing spikelets. Florets not separated in fruit, and the margins of the pale not rolled inwards in fruit.

The greater part of what has been called B. racemosus in Britain is doubtless a small state of B. commutatus, while in some cases the name has been applied to a glabrous state of B. mollis, but besides these, we have in Britain the plant named B. racemosus on the Continent.

Racemose Brome-Grass.

French, *Brome des Prés.* German, *Traubenformige Trespe.*

SUB-SPECIES II.—**Bromus commutatus.** *Schrad.*

PLATE MDCCCII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLIII. Fig. 47.

Billot, Fl. Gall. et Germ. Exsicc. No. 1091.

B. pratensis, *Ehrh.* *Sm.* Eng. Bot. ed. i. Sub. No. 1984. *Fries*, Mant. iii. p. 9, & Summ. Veg. Scand. p. 76.

B. racemosus, var. commutatus, *Hook. fil.* Stud. Fl. p. 451.

B. arvensis, *Sm.* Engl. Bot. ed. i. No. 920, & Engl. Fl. Vol. I. p. 155.

Serrafalcus commutatus, *Bab.* Man. Brit. Bot. ed. vi. p. 422. *Parl.* Fl. Ital. Vol. I. p. 390. *Gren. & Godr.* Vol. III. p. 589.

Panicle drooping, except in starved specimens, when it is sometimes erect. Lower panicle-branches frequently with 2 or more spikelets. Spikelets oblong-lanceolate, always very acute. Lower pale not uniformly curved on the margins from the base to the apex, but with an obtuse angle a little beyond the middle on each side.

By roadsides and in dry pastures and cultivated ground. Rather common. Generally distributed in England. More local in Scotland, extending north to Moray and Argyle. Said to be rare in Ireland, but with the following qualification by Dr. D. Moore:—"The distribution of this grass is very imperfectly known."

England, Scotland, Ireland. Biennial. Summer.

Stems 9 to 30 inches high, often more or less arching. Panicle 2 to 18 inches long, $\frac{5}{8}$ to $1\frac{1}{4}$ inches long, often slightly tinged with reddish. Florets $\frac{1}{4}$ to $\frac{1}{3}$ inch long, exclusive of the awn.

Very similar to B. eu-racemosus, but with the stem more slender, and the panicle and spikelets usually larger and more or less drooping, in consequence of their weight. Spikelets more pointed, and dimmer in colour, often with a faint tinge of reddish brown; the margins of the pales with an obtuse angle, so that in profile they are half-obovate, while in B. eu-racemosus they are half-oval. The margins of the pales are more involute in fruit in B. commutatus than in B. eu-racemosus, but much less so than in B. secalinus.

Confused Brome-Grass.

French, *Serrafalcus confondu.* German, *Traubenformige Trespe.*

SPECIES IX.—BROMUS MOLLIS. *Linn.*

PLATES MDCCCIV. MDCCCV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLIII. Figs. 345 and 346.
Billot, Fl. Gall. et Germ. Exsicc. No. 1091.
Serrafalcus mollis, *Parl.* Fl. Ital. Vol. I. p. 395. *Bab.* Man. Brit. Bot. ed. vi. p. 422.

Biennial or annual. Stem erect or ascending or decumbent, finely pubescent or puberulent, more pubescent on the knots. Leaves pubescent, greyish-green; sheaths split at the apex only, densely pubescent with long or short reflexed hairs. Panicle erect in flower and fruit, simple or slightly branched, rather dense or dense, slightly open in flower, contracted in fruit. Rachis usually with approximate nodes. Panicle branches 1 to 5 at the lower nodes of the rachis unequal, sometimes all reduced to pedicels, but more commonly the longer ones branched, and bearing from 2 to 4 spikelets, unbranched and bare of spikelets for half their length, not more than the length of two internodes of the rachis, the shortest of the lower ones and all those in the upper part of the panicle, or all of them reduced to pedicels, pubescent. Pedicels mostly shorter than their spikelets, the upper ones and those of the florets on the branches very short or almost obsolete. Spikelets erect in flower and fruit, at first oval-lanceolate and acute, ultimately oval and obtuse or subobtuse, 4- to 15-flowered, greyish-green. Glumes unequal, the inner or larger one extending half way to the apex of the fifth, or even of the eighth, floret. Florets very closely imbricated in flower and fruit. Lower pale with a prominent obtuse angle on the margins, half way between the middle and the apex on each side, 5-ribbed, notched at the apex, pubescent or subglabrous, or rarely wholly glabrous, with broad pale scarious margins. Awn from the bottom of the notch of the pale, nearly straight and erect, or bent outwards in fruit, usually a little shorter than the pale. Upper pale a little shorter than the lower.

Var. α, *genuinus*.

PLATE MDCCCIV.

B. mollis, *Fries*, Summ. Veg. Scand. p. 76.

B. Ferronii "*Mabille*," test. *Lloyd*, Fl. de l'Ouest de la France, ed. ii. p. 595. (A small form with a nearly simple contracted panicle.)

Serrafalcus mollis, *Gren. & Godr.* Fl. de Fr. Vol. III. p. 590.

Stems erect or ascending. Spikelets pubescent. Awns nearly straight and erect.

Var. β, *glabrescens*, *Coss.*

B. mollis, leiostachys, *Fries*, Summ. Veg. Scand. p. 76, and B. hordeaceus, "*Linn.*" *Fries*. Mant. iii. p. 11, & Summ. Veg. Scand. pp. 76, 248.

Serrafalcus hordeaceus, *Gren. & Godr.* Fl. de Fr. Vol. III. p. 590. (A small form with a contracted simple panicle.)

Stems erect or ascending. Spikelets subglabrous, or rarely quite glabrous. Awns nearly straight and erect. Usually smaller than var. α.

Var. γ, *Lloydianus*.

PLATE MDCCCV.

B. molliformis, *Lloyd*, Fl. de l'Ouest de la Fr. ed. ii. p. 595. *Bor.* Fl. du Centr. de la Fr. ed. iii. 708.

Serrafalcus Lloydianus, *Gren. & Godr.* Fl. de Fr. Vol. III. p. 591.

Stems ascending. Spikelets densely pubescent. Awns bent outwards in fruit. Panicle always nearly simple and contracted.

Very common and generally distributed. Var. β generally in drier places than var. α; but small forms both of α and β are to be found in sand and dry places on the sea-shore. Var. γ on sandy sea-shores in Cornwall and the Channel Islands; and I have a specimen collected by the late Mr. M'Nab at Balmae, Kirkcudbrightshire, so it is likely to be found along the western coast of England.

England, Scotland, Ireland. Perennial. Early Summer to Autumn.

A very variable plant, the stems varying in height from a few inches to 2 feet or more. Panicle 1 to 6 inches long. Spikelets ½ inch to 1 inch long. Florets about ¼ inch long, or a little longer.

There is a small maritime form of both vars. α and β, but I am unable to draw any lines of demarcation between these and inland forms, which again pass gradually into the most developed states of these two varieties.

Var. γ is remarkable for the awns ultimately twisting outwards, a character which has remained constant under cultivation through several years. I have raised it from seed collected at the Lizard, Cornwall, by Mr. C. Bailey, in July 1866, for five years.

Distinguished from B. eu-racemosus by its more pubescent sheaths, by its more dense panicle, by its florets being more closely imbricated, and by the lower pale being strongly angled on each side beyond the middle.

From B. commutatus it is separable by its erect and denser panicle, by its less acute spikelets, by its more closely imbricated florets, and by the margins of the lower pale having a more prominent angle. The spikelets are of a greyer green and the pales have broader pale scarious margins, so that their colour is less uniform than that of B. eu-racemosus and B. commutatus.

From B. secalinus it may be known by the florets not being separated in fruit, and by the leaf sheaths being densely pubescent.

Soft Brome-Grass.

German, *Weichhaarige Trespe.*

SPECIES X.—**BROMUS ARVENSIS.** *Linn.*

PLATE MDCCCVI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXLIII. Fig. 343.

Serrafalcus arvensis, *Parl.* Fl. Ital. Vol. I. p. 323. *Bab.* Man. Brit. Bot. ed. vi. p. 423. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 588.

Annual or biennial. Stem erect or ascending, very slender, quite glabrous; knots subglabrous. Leaves pubescent, green; sheaths split at the apex only, densely pubescent with short reflexed hairs. Panicle erect in flower and fruit, much branched or rarely only slightly branched, very lax, widely open in flower, and slightly so in fruit. Rachis with very distant nodes. Panicle branches 1 to 7 at the lower nodes of the rachis, unequal, very rarely all reduced to pedicels, the longer ones commonly branched and bearing from 2 to 12 spikelets, unbranched and bare of spikelets for half or two-thirds of their length, usually about the length of three internodes of the rachis, the shorter of the lower ones and all those of the upper part of the panicle, or rarely all of them, reduced to pedicels, finely scabrous. Pedicels, except a few of the lateral ones, longer than their spikelets. Spikelets slightly drooping in flower, erect in fruit, at first linear-subcylindrical and acute, ultimately linear-oblong and subobtuse, 6- to 12-flowered, green, almost always variegated with purple and white. Glumes unequal, the inner or larger one extending half way to the apex of the third floret. Florets loosely imbricated in flower and fruit. Lower pale, with a prominent obtuse angle on the margins half way between the middle and the apex at each side, deeply bidentate at the apex, quite glabrous or very minutely scabrous, with broad white scarious margins. Awn from the bottom of the notch of the pale, straight, erect or slightly curving outwards, a little longer than the pale. Upper pale nearly as long as the lower.

In fields of saintfoin and clover, and by waysides; doubtless introduced with foreign seed, but plentiful in Kent and Cambridge, and more sparingly in Surrey and Essex and York; on waste ground in Middlesex and Hampshire; also on ballast hills at Middlesborough, Durham; and Charleston, and Inverkeithing, Fife.

[England]. Annual or biennial. Summer, Autumn.

Stems 6 to 30 inches high, wiry. Leaves similar to those of the preceding species, but narrower, sometimes not more than $\frac{1}{10}$ inch broad. Panicle 1 to 9 inches long. Spikelets $\frac{1}{2}$ to 1 inch long. Florets $\frac{1}{4}$ to $\frac{3}{5}$ inch long.

A well-marked species, distinguished in its fully developed form by its very lax open roundish-pyramidal panicle, with long capillary branches, which are slightly arching from the weight of the spikelets in flower, but become firmer, nearly straight, and ascending in fruit. The spikelets are narrower and more parallel-sided than in any other of our species; the pales narrower, with 2 more acute and longer teeth at the apex, and usually they are prettily variegated with green and purple, with white margins.

Our plate represents the panicle much more secundly drooping than it ever is in a living plant, the branches having apparently all been bent over in one direction to get the panicle within the compass of the copper-plate.

Starved specimens sometimes have the panicle nearly or quite simple, but they still have the long slender capillary branches, although these are reduced to pedicels.

B. arvensis is sometimes confounded with B. patulus, M. & K., a plant not sufficiently naturalised to be deserving of a place in the British Flora as yet, though it seems to be more common now than it was some years ago. B. patulus has the panicle smaller than that of B. arvensis, and secundly drooping with shorter branches and larger lanceolate spikelets, which are drooping in flower and fruit, and wholly green; the florets have their lower pales more involute in fruit, so that the florets are separated (though less so than in B. secalinus), and the upper pale is considerably shorter than the lower one. The awn in B. patulus is always bent backwards in fruit.

Field Brome-Grass.

French, *Serrafalcus des Champs*. **German**, *Acker Trespe*.

TRIBE XII.—TRITICEÆ.

Spikelets usually open during flowering, sessile or subsessile, arranged in a simple distichous spike, the rachis of which is excavated to receive them and has at each notch a single spikelet containing 2 to 30 perfect florets. Glumes 2 or 1. Styles absent; stigmas 2, usually protruded at the base of the florets between the margins of the pales. Caryops dorsally compressed, with a furrow on the inner face.

GENUS XL.—**BRACHYPODIUM.** *Pal. de Beauv.*

Spikelets subsessile, solitary, arranged alternately within their broadsides to the rachis in a distichous simple spike, at first cylindrical, afterwards slightly laterally compressed, open during flowering, each containing 5 to 10 perfect florets. Glumes 2, opposite, placed right and left of the rachis, shorter than the florets, unequal, mucronate, strongly-ribbed, subherbaceous. Pales 2; lower one linear-lanceolate, concave, entire, mucronate or awned, subherbaceous; upper pale entire and rounded at the apex, 2-ribbed. Lodicules 2, entire. Stamens 3. Stigmas 2, sessile, terminal, plumose, protruded at the sides of the floret between the basal margin of the pales. Caryops slightly adhering to the upper pale, downy at the apex, narrowly oblong, convex on the back, furrowed on the inner face.

The name of this genus comes from βραχύς, short, and πούς, foot, from the very short pedicels of the spikelets.

SPECIES I.—**BRACHYPODIUM SYLVATICUM.** *Rom. & Schultes.*

PLATE MDCCCVII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXXVI. Figs. 277, 278 and 279.
Billot, Fl. Gall. et Germ. Exsicc. No. 489.
B. gracile, *Pal. de Beauv.* Agrost. p. 101. *Reich.* Ic. l. c. p. 32.
Bromus sylvaticus, *Smith*, Eng. Bot. ed. i. No. 729.
Festuca sylvatica, *Huds.* *Sm.* Engl. Fl. Vol. I. p. 149, non *Vill.*
Triticum sylvaticum, *Mönch; Kunth*, Enum. Plant. Vol. I. p. 445. *Parn.* Grass. of Brit. p. 132.

Perennial. Cæspitose. Rootstock not creeping, producing numerous barren stems or barren tufts and flowering stems, without stolons. Stems erect or arching-ascending, unbranched. Leaves flaccid, very broadly linear, gradually tapering from the middle and very acute, with numerous unequal slightly elevated ribs, and smooth margins, yellowish green or bright green, hairy with long soft hairs; sheaths pubescent with long soft spreading-reflexed hairs, or subglabrous; ligule deltoid, subacute. Spike simple, lax, arching-drooping. Spikelets adpressed to rachis, except at the time of flowering, at first linear-cylindrical-lanceolate, and very acute, ultimately oblong-linear, 5- to 12-flowered, more or less pubescent or glabrous. Inner glume two-thirds the length of the contiguous floret, mucronate or shortly awned, 7-ribbed. Lower pale gradually acuminate and acute, 7-ribbed towards the apex. Awn as long as or longer than the pale, at least in the upper florets. Upper pale a little shorter than and about as broad as the lower one.

Var. *α*, *pubescens.*

Spikelets more or less villose-pubescent.

Var. *β*, *glabrescens.*

Spikelets glabrous.

In woods and hedges, and also on open banks. Rather common and generally distributed, extending north to Orkney. Frequent in Ireland.

England, Scotland, Ireland. Perennial. Summer, Autumn.

Plant growing in small or large round tufts. Stems 9 inches to 2 feet high, usually arching towards the circumference of the tufts. Leaves of the barren stems or shoots 6 to 18 inches long, by $\frac{3}{8}$ to $\frac{1}{2}$ inch broad. Stem leaves $\frac{3}{8}$ to $\frac{5}{8}$ broad. Uppermost stem leaf 4 to 9 inches long, $\frac{1}{4}$ to $\frac{5}{8}$ inch broad. Spike 2 to 8 inches long, with 3 to 10 spikelets. Spikelets $\frac{1}{2}$ to $1\frac{1}{2}$ inches long. Florets about $\frac{3}{8}$ inch long at the base of the spikelet, rapidly diminishing in size towards the apex of the spikelet. Glumes and pales commonly more or less pubescent, at least towards the sides and apex.

The form with glabrous spikelets I have collected only in Fife, but no doubt it will be found elsewhere if looked for.

False Wood Brome-Grass.

French, *Brachypode des Bois.* German, *Wald Zwenke.*

SPECIES II.—**BRACHYPODIUM PINNATUM**. *Pal. de Beauv.*

PLATE MDCCCVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXXVII. Figs. 281 and 282.
Billot, Fl. Gall. et Germ. Exsicc. No. 1981.
Bromus pinnatus, *Linn.* *Sm.* Engl. Bot. ed. i. No. 730.
Festuca pinnata, *Huds.* *Sm.* Engl. Fl. Vol. I. p. 150.
Triticum pinnatum, *Mönch; Kunth*, Enum. Plant. Vol. I. p. 445. *Parn.* Grass. of Brit. pp. 290–296.

Perennial. Subcæspitose or scarcely cæspitose. Rootstock with creeping branches, terminating in tufts of numerous barren stems or barren shoots and flowering stems, and with autumnal or hybernal stolons terminating in barren stems. Stems erect, unbranched, or branched at the base. Leaves firm or rather firm, broadly linear, tapering from below the middle to the apex, very acute, with numerous nearly equal greatly elevated ribs, and scabrous margins, yellowish green, often with a glaucous tinge, hairy with short hairs, or subglabrous; sheaths glabrous, or pubescent with short reflexed hairs; ligule subquadrate, obtuse. Spike simple, rather lax or dense, erect or very slightly arching-drooping. Spikelets diverging from the rachis, at first linear-cylindrical-fusiform and acute, ultimately elliptical-linear, 7- to 20-flowered, glabrous or more or less pubescent. Inner glume about half the length of the contiguous floret, acute or mucronate, 7-ribbed. Lower pale abruptly acuminate and subacute, 7-ribbed towards the apex. Awn shorter than the pale, usually not half as long, and frequently reduced to a mere mucro. Upper pale as long as and broader towards the apex than the lower one.

Var. α, *glabrescens*.

Spikelets glabrous.

Var. β, *pubescens*.

Spikelets more or less finely pubescent with short hairs.

On downs and in pastures, especially in chalky or limestone districts. Rather local, but frequent in the south and east of England, reaching north to Yorkshire. It has been reported from both Scotland and Ireland, but there is little doubt B. sylvaticum has been mistaken for it.

England. Perennial. Summer.

Stems 9 to 30 inches high. Leaves of the barren shoots 2 inches to 2 feet long, by ¼ to ½ inch broad. Stem leaves smaller, the uppermost 1 to 4 inches long by ⅛ to ¼ inch broad. Spikes 1 to 8 inches long, with 3 to 12 spikelets. Spikelets $\frac{1}{2}$ to $1\frac{3}{4}$ long, sometimes slightly curved outwards when it is Bromus corniculatus, *Lam.* Fl. Fr. Vol. III. p. 608. Florets $\frac{3}{5}$ inch long.

Very similar to B. sylvaticum, but always distinguishable by its creeping root. The stems are more rigid. The leaves are stiffer and more erect, and become involute when withered from the shrivelling of the thick ribs on the upper surface. The spikelets are broader in the middle and more nearly erect. The awns are much shorter. The lower pale broader, and the upper pale longer and broader.

Barren False-Brome-Grass.

French, *Brachypode primielle.*

GENUS XLI.—**TRITICUM.** *Linn.*

Spikelets quite sessile, solitary, arranged alternately with their broadsides to the rachis in a distichous simple spike, laterally compressed, flat on both sides or turgid, usually open during flowering, each containing 2 to 12 perfect florets, generally with 1 or 2 male or neuter florets above them. Glumes 2, opposite, placed right and left of the rachis, equal, shorter than the florets, rounded or keeled on the back, many nerved, obtuse or awned, subcoriaceous or subherbaceous. Pales 2; the lower one concave, entire, apiculate or awned, subherbaceous or subcoriaceous; upper pale 2-toothed or notched, 2-ribbed. Lodicules 2, entire. Stamens 3. Stigmas 2, sessile, terminal, plumose, usually protruded at the sides of the floret between the basal margins of the pales, or included. Caryops free or adhering to the upper pale, pilose at the apex, oblong, convex on the back, furrowed on the inner face.

All the British specimens belong to the section Agropyrum, having the spikelets not turgid, and being perennial plants.

The name of this genus comes from the Latin word *tero*, to bruise, because its produce is ground into flour.

SPECIES I.—**TRITICUM CANINUM.** *Huds.*

PLATE MDCCCIX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXIX. Fig. 254.
Billot, Fl. Gall. et Germ. Exsicc. No. 2598.
T. Sepium, *Lam. D.C.* Fl. Fr. Vol. III. p. 85.
Agropyrum caninum, *Rom. & Schultes*; *Gren. & Godr.* Fl. de Fr. Vol. III. p. 609. *Parl.* Fl. It. Vol. I. p. 495. *Reich.* Ic. l. c. p. 29.
Braconnotia elymoides, *Godr.* Fl. de Lorr. Vol. III. p. 193.
Elymus caninus, *Linn.* Sp. Plant. p. 124.

Loosely cæspitose. Rootstock not at all creeping, without stolons.

Stems fasciculate, erect, flexuous, weak, hollow. Leaves flaccid, broadly linear, gradually tapering to the apex, very acute, flat, not involute when dry, with numerous slender unequal non-contiguous slightly scabrous ribs, thinly pubescent with short rather soft hairs, bright green. Spike slightly arching or erect, rather lax, rarely compact, with prominent scale-like bracts at the base of the lower spikelets. Rachis not fragile, glabrous or pubescent, scabrous on the angles. Spikelets 2- to 5-flowered, longer than the internodes, and sometimes equalling 2 internodes, fusiform, slightly compressed. Glumes variable in length, from half as long to as long as the spikelet, the lower one usually equalling the first floret, not overlapping each other at the base, linear-elliptical, acuminate and very acute, or even shortly awned, strongly ribbed. Lower pale linear-lanceolate, gradually pointed and acute, with 2 very obscure teeth at the apex, smooth towards the base, distinctly 5-ribbed in the apical third, awned, very rarely only mucronate. Awn slender, usually as long as the pale, or sometimes longer, rarely only half as long, or in some of the florets reduced to a short mucro.

Var. α, *genuinum.*

Spikelets 3- to 5-flowered. Awn as long as or longer than the pale.

Var. β, *biflorum, Mitt.* (?)

T. alpinum, *Don.* MS.

Spikelets about 2-flowered. Leaves narrower than in var. α, and smooth on both sides.

In woods and shady places, and on hedge-banks. Local and rather scarce. Thinly but widely distributed throughout Britain, from Cornwall and Kent to Sutherland, and perhaps Orkney. Scarce in Ireland. Var. β, "Rocks on Ben Lawers. G. Don in Mr. Borrer's Herbarium." Mr. W. Mitten.

England, Scotland, Ireland. Perennial. Late Summer.

Plant growing in small lax tufts, with a few short barren and flowering stems—the latter 18 inches to 3 feet high. Leaves 6 inches to 1 foot long by ¼ to ½ inch broad. Spikes 3 to 6 inches long. Spikelets ⅗ to ⅘ inch long, exclusive of the awns. Florets ⅖ to ½ inch long, exclusive of the awns.

Var. β I have never seen. Dr. Hooker considers it to be T. repens, but the plant is said to be "not running at the roots."

Wood Couch-Grass.

German, *Hunds Weizen.*

SPECIES II.—TRITICUM REPENS. *Linn.*

PLATES MDCCCX. MDCCCXI. MDCCCXII.

Not cæspitose or loosely cæspitose. Rootstock exclusively creeping with long stolons. Stems solitary or subsolitary or fasciculate, erect or ascending, straight or slightly flexuous, or geniculate at the base, firm. Leaves flaccid or firm, broadly linear, tapering to the apex, acute, flat, sometimes involute when dry, with numerous unequal, slender and non-contiguous, or thick cartilaginous and contiguous, scabrous ribs, with or without distant long or rather long soft hairs, bright green or more or less glaucous. Spike erect or more or less arching, compact, sometimes lax at the base, or wholly lax, with indistinct scale-like bracts at the base of the lower spikelets, or without them. Rachis pubescent or glabrous, scabrous or smooth on the angles, not fragile when dry. Spikelets 3- to 12-flowered, longer than the internodes, elliptical or elliptical-wedge-shaped or elliptical-linear, compressed. Glumes commonly three-quarters the length of the spikelets, but sometimes not more than half their length, usually a little shorter than the first floret, linear-lanceolate, acuminate, acute, or awned, or obtuse, strongly ribbed when dry. Lower pale linear-lanceolate, gradually pointed and acute, or obtuse, smooth, indistinctly 5-ribbed at the apex only, mucronate or awned, or apiculate. Awn when present short, usually shorter than the pale, rarely as long, but more commonly represented by a short mucro, or by an apiculus only.

SUB-SPECIES I.—Triticum eu-repens.

PLATE MDCCCX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXX. Figs. 257 to 261.
Billot, Fl. Gall. et Germ. Exsicc. No. 2597.
T. repens, *Auct. Plur.* *Duval-Jouve*, Mém. del Acad. de Montpelier, Vol. VII. p. 371. *Bab.* Man. Brit. Bot. ed. vi. p. 424. *Hook. fil.* Stud. Fl. p. 453.
Agropyrum repens, *Pal. de Beauv.* *Gren. & Godr.* Fl. de Fr. Vol. III. p. 608. *Parl.* Fl. Ital. Vol. II. p. 496. *Reich.* Ic. l. c. p. 30.

Stems solitary or subsolitary, rarely in loose fascicles, erect, straight or slightly flexuous, hollow. Leaves flaccid, not distinctly or regularly involute when dry, with numerous slender slightly elevated unequal distant ribs, each of which is furnished with a single row of asperities, and usually with distant rather long soft hairs, green or slightly glaucous. Spike erect or slightly arching, compact or rarely lax, occupying one-fourth to one-tenth of the stem. Rachis pubescent, often scabrous on the angles. Spikelets more or less diverging from the rachis, 3- to 7-flowered, generally equalling 2 or even 3 internodes, ultimately elliptical or elliptical-wedgeshaped, much compressed. Glumes usually at least three-fourths the length of the spikelets, and always more than half their length, commonly acute or awned, rarely obtuse. Lower pales acute or awned, or rarely obtuse with a very short apiculus. Axis of spikelets scabrous, with slender internodes.

Var. α, *genuinum*. *Duval-Jouve.*

Glumes lanceolate-acute. Pales mucronate.

Var. β, *barbatum*. *Duval-Jouve.*

Glumes tapering, subulate or awned. Pales awned.

Var. γ, *obtusum*.

Glumes obtuse, obliquely-truncate. Pales obtuse, with a minute apiculus.

In cultivated ground and waste places, by road-sides, and on the sea-shore, occasionally in woods. Common and universally distributed.

England, Scotland, Ireland. Perennial. Late Summer.

Very variable. Stems 1 to 4 feet high. Leaves 2 inches to 1 foot long by $\frac{1}{4}$ to $\frac{5}{8}$ inch broad, sometimes rather firm when growing in dry soils, with slender slightly elevated ribs, which are not cartilaginous, and each of which is furnished with a row of minute points. Spike 2 to 8 inches long, not more than one-fourth the length of its stem, and often much shorter in proportion. Spikelets $\frac{3}{8}$ to $\frac{3}{4}$ inch long, usually so crowded that they diverge considerably from the rachis, but in luxuriant specimens a few spikelets are commonly separated from the others towards the base of the spike. Florets $\frac{3}{8}$ to $\frac{1}{2}$ inch long exclusive of the awn, which is very variable in length.

The awned variety is the only form of T. eu-repens which can be mistaken for T. caninum, but it may be distinguished from the latter by its creeping and stoloniferous rootstock. The stems also are firmer. The leaves are thicker and tapering for a less portion of their length and of a duller green. The spike is more compact. The spikelets are ultimately much more compressed and broader in proportion to their length. The glumes are more parallel-sided. The pales are less distinctly nerved towards the apex, and the awns are stouter and generally shorter than in T. caninum.

Common Couch-Grass.

SUB-SPECIES II.—**Triticum pungens.** *Koch.*

PLATE MDCCCXI.

T. repens, var. γ. *Sm.* Engl. Fl. Vol. I. p. 183 (in part, ?).
T. littorale, *Host*; *Duval-Jouve*, Mém. de l'Acad. de Montpel. Vol. VII. pp. 374 and 377.
Agropyrum pungens, *Röm. & Schultes*, Syst. Veg. p. 753. *Parl.* Fl. Ital. Vol. I. p. 498.
A. pungens and A. pycnanthum, *Gren. & Godr.* Fl. de Fr. Vol. III. p. 606.
A. littorale and A. acutum, *Reich*, Ic. Fl. Germ. et Helv. Vol. I. p. 30.

Stems in rather dense fascicles, erect, rarely ascending, straight, solid in the upper internodes. Leaves firm, distinctly and regularly involute, especially towards the apex when fading or dry, with numerous thick very prominent slightly unequal contiguous ribs, each of which is furnished with a single row of asperities, and usually glabrous, green or glaucous. Spike erect, compact, occupying one-fourth to one-tenth of the whole stem. Rachis rigid, glabrous or pubescent, scabrous on the angles. Spikelets more or less diverging from the rachis, 5- to 12-flowered, generally equalling 2 or even 3 internodes, ultimately elliptical or elliptical-wedgeshaped, much compressed. Glumes usually half the length of the spikelets, and only in few flowered spikelets reaching to three-quarters of their length, acute or awned or obtuse, with a keel scabrous towards the apex. Pales mucronate or awned, or obtuse with a very short apiculus. Axis of spikelets puberulent ("glabrous," Duval-Jouve,) with rather broad internodes enlarged upwards.

Var. α, *genuinum.*

PLATE MDCCCXI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXXII. Fig. 266 ("A. acutum.")

Glumes and pales subobtuse, apiculate or very shortly mucronate.

Var. β, *littorale.*

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXXI. Fig. 263.
Agropyrum pungens, *Gren. & Godr.* Fl. de Fr. Vol. I. p. 606.
A. littorale, *Reich*, Ic. l. c. p. 30.

Glumes acuminate. Pales acuminate and mucronate or awned.

Var. γ, *pycnanthum.*

Agropyrum pycnanthum, *Gren. & Godr.* Fl. de Fr. Vol. I. p. 606.

Glumes abruptly rounded and obtuse. Pales obtuse not mucronate, but sometimes apiculate. Spike more compact, and consequently with the spikelets more diverging from the rachis than in vars. α and β. Plant more glaucous.

On sea-shores, especially by the banks of tidal rivers and back-waters. Probably common in England. I have specimens from Devon, Isle of Wight, Sussex, Kent, and Essex. Babington gives it as a native of Scotland, though without naming any definite station. In Ireland it is said, in the "Cybele Hibernica," to be "probably common." I have seen specimens from the neighbourhood of Dublin.

England, Scotland (?), Ireland. Perennial. Late Summer.

Stem 1 to 4 feet high, usually rigid. Leaves 3 inches to 1 foot long by $\frac{1}{4}$ to $\frac{1}{2}$ inch broad, remarkable for their greatly raised ribs resembling those of Elymus arenarius, commonly more or less glaucous above and green below, but very variable in colour. Spikes 2 to 10 inches long. Spikelets $\frac{3}{8}$ to $\frac{7}{8}$ inch long, usually glaucous. Florets $\frac{1}{4}$ to $\frac{1}{2}$ inch long.

Very variable in size and colour, and exhibiting the same variations as occur in T. eu-repens, from which indeed it can only be certainly distinguished by the structure of the leaves: the very prominent cartilaginous ribs in T. pungens completely filling up the upper surface of the leaf; these cartilaginous ribs shrivel in drying, and consequently, when the leaves are no longer in vigorous growth, and still more so when the leaves are allowed to wither, the upper surface of the leaf contracts more than the lower, and consequently the edges of the leaves become involute, especially towards the apex, which becomes pungent.

The plant grows in compact tufts of flowering and barren stems, which is rarely the case in T. eu-repens, although it does occasionally occur in that plant.

The Rev. W. W. Newbould informs me that T. repens, var. γ, in Smith's Herbarium, is represented by T. pungens.

I suspect that T. repens, β. littoreum, *Bab.* Man. Brit. Bot. ed. vi. p. 424, ought also be referred to T. pungens, as the leaves being "involute" makes it probable that there must be cartilaginous ribs on the upper side; but I have not seen specimens named by Professor Babington.

A variety (δ. intermedium) occurs on the continent, in inland stations, which has not been detected in Britain, though it ought to be looked for. This is the T. campestre, *Gren. & Godr.* which Duval-Jouve identifies with T. intermedium, Host. In this variety the spike is less compact, and the spikelets more closely applied to the rachis than in the vars. above mentioned, and the whole plant has an intensely glaucous hue.

Erect Sea Couch-Grass.

SUB-SPECIES II.—**Triticum acutum.** *D.C.*

PLATE MDCCCXII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXXI. Fig. 262.

Duval-Jouve, Mém. de l'Acad. de Montpelier, Vol. VII. p. 387, and *Planche,* 20, Fig. 3. Optime!

T. laxum, *Fries.* Mant. III. p. 13, and Summ. Veg. Scand. pp. 74 and 249.

T. pungens, *Pers.* ? Syn. Pl. p. 109.

"T. affine, *Dethharding,*" teste *Reich.*

Agropyrum acutum, *Röm. & Schultes,* Syst. Veg. Vol. II. p. 751. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 605. *Parl.* Fl. Ital. Vol. I. p. 499.

Stems in loose fascicles or solitary, ascending or suberect, usually from a decumbent and geniculate base, solid. Leaves firm, involute, especially towards the apex when fading or dry, with numerous thick rather prominent unequal contiguous subcartilaginous ribs, each of which is thickly clothed with minute asperities, not disposed in 1 or 2 regular lines, and glabrous or with a few rather long soft distant hairs, green or glaucous. Spike more or less slightly arching, lax, one-half to one-fourth of the whole stem. Rachis rather firm, glabrous, scabrous or smooth on the angles, not fragile. Spikelets adpressed to the rachis or slightly curving outwards, 5- to 8-flowered, but little longer than the internodes, and very rarely equalling 2 internodes, ultimately linear-elliptical, slightly compressed. Glumes two-thirds to three-fourths the length of the spikelets, rarely half the length, subobtuse or subacute or apiculate, with a smooth keel. Pales obtuse, apiculate or more rarely mucronate, or very rarely shortly awned. Axis of the spikelets puberulent, with the internodes broad, greatly enlarged upwards.

On sandy sea-shores. Probably common and generally distributed, though I have not seen specimens from north of St. Andrews, Fife, and Cumberland. In Ireland, according to the "Cybele Hibernica," it is frequent, and extends from north to south of the island.

England, Scotland, Ireland. Perennial. Late Summer, Autumn.

Stems 6 inches to 3 feet high. Leaves 1 to 18 inches long by $\frac{1}{4}$ to $\frac{1}{2}$ inch broad. Spike 3 to 10 inches long. Spikelets $\frac{7}{8}$ to 1 inch long. Florets $\frac{1}{2}$ to $\frac{5}{8}$ inch long.

Intermediate in habit between T. pungens (particularly the continental var. intermedium) and T. junceum. From T. pungens it differs in the stems not growing in rather dense tufts, and being less rigid, less upright, and almost always less geniculate towards the base; in the leaves being less rigid, from the ribs being not so prominent, and on this account they are also less regularly involute, and under pressure are easily dried flat, which it is difficult to do with those of T. pungens. The ribs of the leaves of T. acutum are also thickly covered all over with very minute asperities, not with a single row of large ones as we find in T. pungens. The spike is lax, and occupies a much greater part of the stem than in T. pungens. The spikelets are more closely applied to the rachis, usually longer and narrower in proportion. The axis of the spikelet is more distinctly puberulent, so as almost to deserve to be called minutely pubescent.

The characters which distinguish T. acutum from T. junceum will be mentioned under that species.

Perhaps T. pungens and T. acutum ought to be combined in a ver-species distinct from T. repens on account of the different structure of the leaves. I have repeatedly endeavoured to raise our two maritime forms of Triticum from seed, but never could get it to germinate; as in many other extensively creeping plants, the seed appears to be but rarely perfected.

I have followed Mr. Lloyd ("Fl. de l'Ouest de la France," ed. ii. p. 600) in joining T. pungens, *Auct.*, campestre, *G. & Gr.*, and acutum, *D.C.*, with T. repens, rather than Dr. Hooker ("Stud. Flora," p. 454), who considers them as subspecies of T. junceum, with which they have certainly far less affinity than they have with T. repens, but it would be highly desirable that they should be raised from seed, should any botanist on the coast be fortunate enough to obtain it.

The figure which Reichenbach gives of "T. acutum," in the Ic. Fl. Germ. et Helv. Tab. CXXII. Fig. 266,* appears to me to represent T. pungens; while that of A. affine, Tab. CXXI. Fig. 262, is a fair representation of T. acutum.

Decumbent Sea Couch-Grass.

German, *Spitziger Weizen.*

SPECIES III.—TRITICUM JUNCEUM. *Linn.*

PLATE MDCCCXIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXXII. Fig. 267.

Billot, Fl. Gall. et Germ. Exsicc. No. 2985.

Duval-Jouve, Mém. de l'Acad. de Montpelier, Vol. VII. p. 390.

Agropyrum junceum, *Pal. de Beauv.; Gren. & Godr.* Fl. de Fr. Vol. I. p. 604. *Parl.* Fl. Ital. Vol. I. p. 502.

Not cæspitose. Rootstock extensively creeping, with long stolons. Stems solitary or loosely fasciculate, ascending or suberect, usually from a decumbent and geniculate base, firm, solid. Leaves firm, thick, narrowly linear, tapering to the apex, greatly involute especially towards the apex when fading or dry, with numerous thick very prominent slightly unequal contiguous cartilaginous ribs, each of which is very densely clothed with extremely short velvety hairs. Spike usually more or less slightly arching, lax, one-half to one-fourth of the whole stem. Rachis rather firm, glabrous, smooth on the angles, readily breaking across at the nodes when dry. Spikelets adpressed to the rachis, 4- to 8-flowered, as long as or a little longer than the internodes but not equalling 2 internodes, ultimately linear-elliptical, slightly compressed. Glumes half to three-fourths the length of the spikelets, obtuse truncate or subapiculate, with a smooth indistinct keel. Pales obtuse, obliquely-truncate or notched, apiculate, not awned. Axis of the spikelets puberulent, with the internodes greatly enlarged upwards.

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* These quotations refer to the *second* edition of Reichenbach's Icones.

On sandy sea-shores, and on dunes where there is loose sand; common and generally distributed, extending north to Orkney.

England, Scotland, Ireland. Perennial. Summer, Autumn.

Stems 6 inches to 2 feet high. Leaves 2 to 8 inches long by $\frac{1}{8}$ to $\frac{1}{4}$ inch broad, very glaucous. Spike 2 to 9 inches long. Spikelets $\frac{5}{8}$ to $1\frac{1}{4}$ inch long. Florets $\frac{3}{8}$ to $\frac{3}{4}$ inch long.

Very similar in habit to T. acutum, but with the leaves narrower and ultimately much more involute, thicker, or even somewhat fleshy, with the ribs fewer, much more prominent, and more cartilaginous, and densely clothed with a pile of very short white hairs, the upper surface more glaucous. The rachis is remarkable for the facility with which it ultimately breaks across at the nodes, thus separating into internodes, with the spikelets attached to their apex. The glumes have fainter and more numerous ribs. The pales are more obtuse, and commonly more or less notched, and the apiculus is shorter. The whole plant is usually more glaucous, especially the upper side of the leaves and the spikelets.

Sand Couch-Grass.

German, *Binsenformiger Weizen.*

GENUS XLII.—LOLIUM. *Linn.*

Spikelets quite sessile, solitary, arranged alternately edgeways to its rachis in a distichous simple spike, laterally compressed, flat on both sides, open during flowering, each containing 3 to 20 perfect florets. Glumes 2 in the terminal floret, nearly equal: in all the lateral florets only 1, placed on the side of the spikelet away from the rachis, sometimes with a very minute rudimentary one on the side next the rachis, concave, rounded on the back, obtuse or acute, not awned, subherbaceous. Pales 2, the lower one rounded on the back, with or without an awn inserted beneath the summit, subherbaceous. Upper pale 2-toothed at the apex, scarious. Lodicules 2, entire or lobed. Stamens

3. Stigmas 2, terminal, sessile, plumose, protruded at the sides of the floret between the basal margins of the pales. Caryops free, or rarely adhering to the upper pale, wholly glabrous, oblong, convex on the back, broadly furrowed on the inner face.

The derivation of the name of this genus is supposed to be from *linum*, flax; and *colo*, I till.

SPECIES I.—**LOLIUM PERENNE.** "*Linn.*," *Hook. fil.*

PLATES MDCCCXIV. MDCCCXV.

Perennial, biennial, or annual. Spikelets 3- to 20-flowered, linear-elliptical, tapering from the middle to the apex, not truncate. Glumes shorter than the spikelets (except in monstrous forms), equalling or shorter than the contiguous floret. Florets linear-lanceolate, slightly curved on the inner margin in profile, not turgid in fruit. Lower pale not indurated in fruit, elliptical-linear, obtuse or faintly notched with blunt cusps, not awned or with a slender awn. Caryops linear-oblong, about half the length of and a little narrower than the pales.

SUB-SPECIES I.—**Lolium eu-perenne.**

PLATE MDCCCXIV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXII. Fig. 35.
Billot, Fl. Gall. et Germ. Exsicc. No. 2778.
L. perenne, *Auct. Plur.* *Sm.* Eng. Bot. ed. i. No. 315, &c.

Perennial, with barren shoots. Flowering stems several, usually decumbent and geniculate at the base. Leaves narrowly linear, tapering slightly to the apex, deep green. Spikelets closely applied to the rachis, except during the time of flowering, when they diverge slightly, 3- to 11-flowered. Lower pale not awned.

Var. α, *genuinum*, *Godr.*

Spike robust. Spikelets 7- to 11-flowered.

Var. β, *tenue.*

L. tenue, *Linn.* Spec. Plant. p. 122 (non *Guss.*).

Spike slender. Spikelets 3- to 4-flowered. Whole plant much more slender than in var. α.

In meadows and pastures and by roadsides, &c. Very common and generally distributed.

England, Scotland, Ireland. Perennial. Summer.

Plant growing in small tufts, with the stems more or less leaning outwards towards the circumference of the tuft, from their bases being usually decumbent and geniculate. Stems 18 inches to 2 feet high, or a little more, erect or ascending. Leaves 3 inches to 1 foot long by 1/8 to 1/4 inch broad, those of the barren shoots conduplicate when young. Spikes 3 to 10 inches long. Spikelets 1/4 to 5/8 inch long. Florets 1/4 inch long.

Var. tenue is rather a starved state than a true variety.

Monstrosities of the spike are not unfrequent. Sometimes it is compound, especially towards the base: sometimes the rachis is shortened and the spikelets diverge widely, forming a flattened, oblong, blunt spike: sometimes the florets are fasciculate within the glumes, and in this case are frequently inflated and abbreviated, so as to be ovoid, and sometimes shorter than the glumes.

Common or Perennial Rye-Grass.

French, *Ivraie vivace.* German, *Englisches Raygras.*

Sub-Species II.—**Lolium Italicum.** *A. Braun.*

Plate MDCCCXV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. LXXVII. (CXIII.) Figs. 238 and 239.
Billot, Fl. Gall. et Germ. Exsicc. No. 1392.
L. Boucheanum, *Kunth,* Enum. Plant. Vol. I. p. 436.

Perennial, with barren shoots, or more often biennial. Stems numerous, usually nearly straight throughout, rarely decumbent and geniculate at the base. Leaves broadly linear, tapering greatly to the apex, yellowish-green. Spikelets loosely applied to the rachis, except during the time of flowering, when they diverge greatly, 5- to 12-flowered. Lower pale with a long slender awn.

In cultivated fields, and by roadsides and waste places. Not unfrequent, but always escaped from cultivation.

[England], [Scotland], [Ireland]. Perennial or biennial. Summer.

Extremely similar to L. perenne, but distinguished by its taller stem, broader leaves, and awned spikelets. The colour of both leaves and spikelets is paler. The root has a great tendency to be merely biennial, flowering only once. The young leaves of the barren shoots are sometimes involute, but conduplicate, as in L. perenne.

Lolium multiflorum, *Lam.*, another sub-species, is strictly annual or at most biennial. The spikes have more numerous florets; the lower pales are broader in the middle, and hence appear more curved on the margins than in L. Italicum; the more scabrous rachis is a character not to be trusted, though I have seen it in all my specimens of L. multiflorum. It cannot be considered as a naturalised plant, though I have met with it about London, especially in the mud dredged from the Thames and deposited on the ground now occupied by Battersea Park.

Italian Rye-Grass.

French, *Ivraie d'Italie.* German, *Italienisches Raygras.*

SPECIES II.—LOLIUM TEMULENTUM. *Linn.*

PLATES MDCCCXVI. MDCCCXVII.

Annual. Spikelets ultimately wedge-shaped, very obtuse or truncate at the apex, 3- to 9-flowered. Glumes as long as or longer than the spikelets, and many times exceeding the contiguous floret. Florets turgid in fruit, half ovate-ovoid, greatly curved on the inner margin in profile. Lower pale somewhat indurated in fruit, oval, deeply notched with subacute cusps, with a stout awn of variable length, or not awned. Caryops oblong-ovoid, nearly as long as and as broad as the upper pale.

Var. α, *genuinum.*

PLATE MDCCCXVI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXI. Figs. 231 and 233.
Billot, Fl. Gall. et Germ. Exsicc. No. 3944.
L. temulentum, *Sm.* Engl. Bot. ed. i. No. 1124, and Engl. Fl. Vol. I. p. 174.

Awns longer than the pales.

Var. β, *arvense.*

PLATE MDCCCXVII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CX. Fig. 229.
Billot, Fl. Gall. et Germ. Exsicc. No. 491.
L. arvense, *With.* *Sm.* Engl. Bot. ed. i. No. 1125; Engl. Fl. Vol. I. p. 174 (non *Schrad.* nec *Reich.*).
L. robustum, *Reich.* Fl. Germ. Excurs. p. 139, and Ic. Fl. Germ. et Helv. Vol. I. p. 25.

Awns shorter than the florets or absent.

In cultivated fields. Rather rare, though widely distributed, extending north to Argyle and Moray, though it is not more than naturalised in Scotland, whatever it may be in England. Locally abundant in Ireland.

England, [Scotland], Ireland. Annual. Summer.

Stems fasciculate, sometimes branched from the lower nodes, 8 inches to 3 feet high or more. Leaves 2 to 8 inches long by $\frac{1}{4}$ to $\frac{1}{2}$ inch broad, tapering gradually to the very acute apex. Spike 2 inches to 1 foot long. Spikelets $\frac{1}{4}$ to $\frac{3}{4}$ inch long, exclusive of the awns.

Florets $\frac{1}{5}$ to $\frac{1}{4}$ inch long, exclusive of the awns. Rachis sometimes smooth, sometimes pulverulent, scabrous.

Readily distinguishable from all the forms of L. perenne by its blunt or truncate fruiting spikelets, long rigid glumes, turgid florets, and large brown caryops.

Lolium linicola, *Sonder*, is a very distinct plant, which, strangely enough, has been confounded with the variety of L. temulentum termed L. arvense by Withering. It may be readily known from L. temulentum by its more slender stem; by its narrower leaves; by the spikelets tapering slightly from beyond the middle to the apex, which is obtuse but not truncate; by the glume being little shorter than, or at most equal to, the spikelet, though always as long as, or longer than the contiguous floret; by the florets being narrower and less turgid, the lower pales less indurated, and by the caryops being considerably smaller and narrower in proportion. The awn is entirely absent, or more rarely present, and then very short. It cannot be considered as a naturalised plant, though it has occurred in flax fields in several places.

Common Darnel.

French, *Ivraie enivrante.* German, *Taumel Lolch.*

TRIBE XIII.—ROTTBOELLIEÆ.

Spikelets open during flowering, sessile, arranged in a simple, distichous or unilateral spike, the rachis of which is excavated to receive them, and has at each notch a single solitary spikelet, containing a single perfect floret, and sometimes a superior rudiment. Glumes 2 or 1. Stigmas 2, sessile, protruded at the base of the florets between the margins of the pales. Caryops dorsally compressed, with a furrow on the inner face.

GENUS XLIII.—**LEPTURUS.** *R. Br.*

Spikelets quite sessile, solitary, arranged alternately in a simple spike, in the excavations of the rachis of which they are completely sunk when closed, open during flowering, each containing a single perfect floret, with the stalk-like rudiment of a second neuter one above it. Glumes 2 in the terminal floret nearly equal; 2 or 1 in all the lateral florets, both of them or the only one on the side of the spikelet furthest from the rachis, as long as or longer than the floret, not awned, many-nerved, subcoriaceous. Pales 2, scarious, the lower one not awned, the upper 2-toothed, 2-ribbed. Lodicules 2, entire. Stamens 3. Stigmas 2, sessile, plumose, protruded at the sides of the flower between the basal margins of the pales. Caryops free, wholly glabrous, narrowly oblong, convex on the back, furrowed on the inner face.

The name of this genus of plants is derived from λεπτός, slender; and οὐρά, a tail—in allusion to its taper slender spikes.

SPECIES I.—LEPTURUS FILIFORMIS. *Trin.*

PLATE MDCCCXVIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CVIII. Fig. 223.
Billot, Fl. Gall. et Germ. Exsicc. No. 2190.
L. incurvatus, β filiformis, *Bab.* Man. Brit. Bot. ed. vi. p. 426.
Ophiurus filiformis, *Röm.* & *Schultes*, Syst. Veg. Vol. II. p. 797.
O. incurvatus, *Lindl.* Syn. Brit. Fl. p. 295.
Rotböllia filiformis, *Roth.* *Bertol.* Fl. Ital. Vol. I. p. 766.
R. incurvata, *Sm.* Engl. Bot. ed. i. No. 760, and Engl. Fl. Vol. I. p. 175.

Flowering stems erect or decumbent, much branched. Ligule very short, truncate. Spikes slender, cylindrical, scarcely tapering to the apex, straight or very slightly curved. Lateral florets with 2 glumes. Pales as long as the glumes.

In salt marshes and waste places by the sea, and on the margins of tidal rivers. Common and generally distributed in the southern half of England, less common in the north. Very local in Scotland, where I know of no stations but Aberledy Bay, Haddington; and Blackness, Linlithgow. Possibly it may have been found near Inverkeithing, Fife; but it is doubtful whether the plant which occurred there was the native L. filiformis, or the continental sub-species L. incurvatus, which has occurred on ballast at St. Davids, in the neighbourhood of Inverkeithing. Frequent but rather local all round the Irish coast.

England, Scotland, Ireland. Perennial. Summer, Autumn.

Stems 2 to 15 inches high or long, branched at most of the nodes. Leaves 1 to 3 inches long by $\frac{1}{12}$ to $\frac{1}{8}$ broad, ultimately involute. Terminal spikes longer than the lateral ones, 1 to 5 inches long. Spikelets $\frac{1}{4}$ inch, closely fitting into the excavations of the rachis, so that, except when the plants are in flower, the spikes resemble slender rushes. Glumes diverging in flower, herbaceous, acuminate, 3-ribbed. Anthers yellowish-white.

The spikes in L. filiformis vary, being sometimes straight, sometimes gently curved, but they are never so greatly curved as in the sub-species L. incurvatus: in this, too, the spikes are thicker, slightly tapering, and the pales are a little shorter than the glumes: the stems also are always decumbent or procumbent.

Sea Hard-Grass.

German, *Fadenförmiger Dunnschwanz.*

TRIBE XIV.—HORDEIEÆ.

Spikelets usually open during flowering, sessile or subsessile, arranged in a simple distichous spike, the rachis of which is excavated to receive them, and has at each notch 2 to 6 spikelets placed side by side, each spikelet containing 1 or more perfect florets; sometimes the lateral spikelets have only a floret. Glumes 2. Stigmas 2, sessile, usually protruded at the base of the florets between the margins of the pales. Caryops dorsally compressed, with a furrow on the inner face.

GENUS XLIV.—**ELYMUS.** *Linn.*

Spikelets quite sessile, in pairs or threes at each node of the rachis, arranged in a simple spike, open during flowering, each containing 2 to 4 perfect florets. Glumes 2 to each spikelet, nearly equal in all the florets, both of them on the side of the spikelet farthest from the rachis, a little shorter or a little longer than the florets, not awned, subcoriaceous or subherbaceous. Pales 2, the lower one rounded on the back, acuminate, pointed or mucronate or awned, subherbaceous or subcoriaceous. Upper pale, 2-toothed, 2-keeled, scarious. Lodicules 2, entire. Stamens 3. Stigmas 2, sessile, inserted a little below the summit of the ovary, plumose, protruded at the sides of the florets between the basal margins of the pales. Caryops adhering to the pales, pubescent at the apex, narrowly linear, convex on the back, furrowed on the inner face.

This genus derives its name from the country where the species are abundant—Elyma, in Greece.

SPECIES I.—**ELYMUS ARENARIUS.** *Linn.*

PLATE MDCCCXIX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXVI. Figs. 247 and 248.

Perennial. Rootstock extensively creeping, with long stolons. Stems erect-ascending, thick, stout. Leaves broadly linear, with numerous thick prominent cartilaginous scabrous-puberulent contiguous ribs, very glaucous above, smooth and green beneath; ligule very short, truncate, minutely ciliated. Spike usually compact, or slightly lax at the base, rarely so throughout, cylindrical, slightly compressed. Spikelets at the base and apex of the spike in pairs, those toward the middle often in threes, mostly 3-flowered, with the uppermost flower male. Glumes linear-lanceolate, acuminate, with subulate points, not awned, as long as the florets, glabrous, usually pubescent at the apex, and frequently ciliated with long soft hairs on the keel and lateral margins near the apex. Lower pale linear—lanceolate, acuminate, shortly mucronate but not awned, densely pubescent with short hairs.

On sandy sea-shores and on dunes amongst loose sand. Rather rare. Possibly in Devon and Dorset and South Wales, and certainly from Essex and North Wales northward to Orkney and Shetland. Rare and very local in Ireland, where it is chiefly found on the north coast.

England, Scotland, Ireland. Perennial. Late Summer.

Plant growing in large roundish tufts, beyond the circumference of which the barren tufts of the stolons come up singly. Leaves 6 inches to 3 feet long by ½ to ¾ inch broad. Stems 2 to 4 feet high, inclining towards the circumference of the tufts. Spikes 6 inches to 1 foot long, straight or slightly arched. Spikelets ¾ to 1 inch long. Florets ¾ to 1 inch long.

Elymus geniculatus, *Curtis*, which was alleged to have been found by Dickson near Gravesend, but which is now known only as a cultivated plant, resembles E. arenarius, but has the rootstock far less creeping, and the stolons so short that their barren shoots come up close to the parent tufts. The leaves are about half the breadth of those of E. arenarius. The spike is not so dense, and the spikelets in the middle of the spike are rarely more than 2 together, and the upper ones are often solitary. The glumes are subulate, glabrous, and much longer than the florets. Spikelets 1- or 2-flowered. The lower pales are subulate, shortly pubescent. The bending of the spike, relied on as a character, is apparently a monstrosity: out of more than two dozen plants raised from seed by me not one had the spike geniculate.

Sand Lyme-Grass.

French, *Élyme d'Europe.* German, *Sand Haargras.*

GENUS XLV.—HORDEUM. *Linn.*

Spikelets quite sessile, or the lateral ones shortly stalked, in threes, very rarely in pairs, at each node of the rachis, arranged in a simple spike, usually open during flowering, each containing a single perfect floret, with a stalk-like rudiment above it, or only the central floret of each triad containing a perfect floret, the lateral ones being male, or the two lateral spikelets with a perfect floret in each, and the central one commonly male or neuter. Glumes 2, both on the side of the spikelet farthest from the rachis, about as long as the floret, pointed and longly awned, subherbaceous. Pales 2, the lower one rounded on the back, longly awned, or rarely not awned in the lateral spikelets, subherbaceous. Upper pale 2-toothed, 2-keeled. Lodicules 2, entire. Stamens 3. Stigmas 2, inserted a little below the summit of the ovary, sessile, plumose, usually protruded at the sides of the floret between the basal margins of the pales. Caryops adhering to the pales, pubescent at the apex, convex on the back, furrowed on the inner face.

"Hordeum," the Latin name of barley.

SPECIES I.—HORDEUM SYLVATICUM. *Huds.*

PLATE MDCCCXX.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXV. Fig. 246.
Billot, Fl. Gall. et Germ. Exsicc. No. 490.
Elymus Europeus, *Linn.* *Sm.* Eng. Bot. ed. i. No. 1317 and Engl. Fl. Vol. I. p. 178. *Kunth*, Enum. Fl. ed. i. p. 432. *Koch*, Syn. Fl. Germ. et Helv. ed. ii. p. 954. *Fries*, Summ. Veg. Scand. p. 74. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 597. *Parl.* Fl. Ital. Vol. I. p. 524. *Reich.* Ic. l. c. p. 28.

Perennial, with barren shoots. Loosely cæspitose. Flowering stems, erect, from a shortly and slightly curved base, which is clothed with brownish fibres derived from decayed leaf sheaths; knots pubescent. Leaves broadly linear, tapering from a little below the middle to the apex, very acute, with numerous slender distant scabrous unequal ribs, usually thinly pubescent with rather long soft hairs, bright but rather dark green; sheaths pubescent, with rather short and stiff reflexed hairs, the uppermost one usually subglabrous; ligule very short, truncate. Spike erect, fusiform-cylindrical. Spikelets adpressed to the rachis, in threes, the lateral ones perfect, sometimes with a second floret, the central one usually male. Glumes of the lateral spikelet linear-subulate, insensibly attenuated into awns of about their own length, not ciliated, those of the central spikelet narrower when it is male, smooth, with the awn scabrous. Florets all sessile within the glumes. Lower pales elliptical-linear, acuminate, bidentate, faintly 3-nerved and scabrous towards the apex. Awn from the bottom of the notch of the pale, and usually about twice its length.

In woods and copses, chiefly on chalk and limestone. Rare. Extending from Wilts, Hants, Kent, and Essex, north to Chester and Northumberland. Very rare in Ireland, where the only station is a shrubbery on the terrace at Mount Merrion, Dublin; but the authors of the "Cybele Hibernica" believe it to be native there.

England, Ireland. Perennial. Late Summer, Autumn.

Stem 1 to 3 feet high. Leaves 3 inches to 1 foot long. Spike 1 to 4 inches long. Spikelets $\frac{5}{8}$ to $\frac{1}{2}$ inch long, exclusive of the awns.

Wood Barley.

SPECIES II.—HORDEUM PRATENSE. *Huds.*

PLATE MDCCCXXI.

Reich. Ic. Fl. Germ. et Helv. Vol. 1. Tab. CXVII. p. 251.
Billot, Fl. Gall. et Germ. Exsicc. No. 1391.
H. secalinum, *Schreb.* *Koch.* Syn. Fl. Germ. et Helv. ed. ii. p. 955. *Fries.* Summ. Veg. Scand. p. 74. *Gren. & Godr.* Fl. de Fr. Vol. III. p. 595. *Parl.* Fl. Ital. Vol. I. p. 521.
H. murinum, var. β, *Linn.* Spec. Plant. p. 126.

Perennial, with barren shoots or barren stems. Rather loosely cæspitose. Flowering stem erect from a shortly and slightly curved or geniculate base, which is clothed with brownish withered leaf-sheaths; knots glabrous. Leaves rather firm, narrowly linear, tapering from a little below the middle to the apex, very acute, with numerous slender rather approximate very scabrous nearly equal ribs, pubescent with rather short and rather stiff hairs, bright-green; lowest sheath pubescent with rather short stiff reflexed hairs, all except the lowest glabrous; ligule very short, truncate. Spike erect, oblong-linear, parallel-sided, tetragonal, compressed, olive-green. Spikelets ascending, diverging slightly from the rachis, in threes, the lateral ones male, the central one perfect. Glumes of all the spikelets setaceous, insensibly attenuated into awns about twice their own length, very scabrous, as well as their awn. Central spikelet with its floret sessile, the lateral ones with their florets stipitate within the glumes. Lower pale of the central spikelets elliptical-linear, acuminate, entire, faintly 3-ribbed towards the apex, wholly glabrous, with a terminal awn about its own length, and as long as the awns of its glumes: lower pale of the lateral spikelets shorter and narrower than that of the central floret, very indistinctly ribbed and conspicuously scabrous-pubescent towards the apex, otherwise glabrous, terminated by an awn shorter than its own length and much shorter than those of its glumes.

In meadows and pastures, and on the drier parts of salt marshes. Frequent and generally distributed in England, especially near the coast. Very rare in Scotland, and probably not native, except in the neighbourhood of Berwick, where it grows on the Scotch side of the Tweed, though this station, being within the Liberties of Berwick-on-Tweed, is politically in England; the other stations given are Ayr;

Salisbury Craigs, Edinburgh, where it does not now exist; Kincardine, Clackmannan; and St. Andrew's, Fife. Local, and usually near the coast in the south and east of Ireland.

England, Scotland, Ireland. Perennial. Summer.

Flowering stems few or rather numerous, 1 to 3 feet high, slender, stiff, flowering nearly together. Barren stems 1 to 8 inches high. Leaves 1 to 5 inches long, by $\frac{1}{8}$ to $\frac{1}{4}$ inch broad, the uppermost stem leaf generally shorter and broader than the others. Spike $1\frac{1}{4}$ to 5 inches long. Perfect florets $\frac{4}{5}$ inch long, later florets $\frac{1}{4}$ inch long in both cases, exclusive of the awns. Fertile spikelets $\frac{1}{2}$ to $\frac{5}{8}$ inch, inclusive of the awns.

Grenier & Godron, and some other authors, strangely enough, state that this species is biennial. It is as truly perennial as Cynosurus cristatus or Dactylis glomerata.

Meadow Barley.

SPECIES III.—HORDEUM MURINUM. *Linn. Auct.*

PLATE MDCCCXXI.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXVII. Fig. 249.
Billot, Fl. Gall. et Germ. Exsicc. No. 1599.

Biennial or annual, without barren shoots. Flowering stems ascending, from a longly geniculate base; knots glabrous. Leaves very flaccid, broadly linear, tapering from the base to the apex, very acute, with numerous slender distant slightly-scabrous unequal ribs, pubescent with rather short and rather stiff hairs, pale green, slightly glaucous; lowest sheath usually pubescent, with rather short and rather stiff hairs, all except the lowest always glabrous; ligule very short, truncate. Spike erect or slightly inclined, broadly oblong linear, usually slightly enlarged upwards, tetragonal, much compressed, glaucous-green. Spikelets ascending-erect, scarcely diverging from the rachis, in threes, the lateral ones male, the central one perfect. Glumes of the central floret lanceolate-linear, attenuated into awns of about twice their own length, ciliated with long stiff hairs: inner glume of the lateral spikelet linear-subulate, insensibly attenuated into an awn about three times its own length, and a little shorter than those of the central spikelet, scabrous, and ciliated with rather short hairs on the inner side (in the British form, but sometimes on both sides in a south European form): outer glume of the lateral spikelets setaceous and awn-like throughout, scabrous, with the point of its awn exceeding by a little that of the central floret, and consequently more conspicuously that of the inner glume of the lateral spikelets. Central spikelet with its floret sessile, the lateral ones with their florets indistinctly stipitate within the glumes. Lower pales of all the florets elliptical-linear, acuminate, entire; that of the central floret strongly 3-ribbed throughout, wholly glabrous, with a terminal awn of more than three times its own length, and twice as long as the awns of the glumes: lower pale of the lateral florets exceeding that of the central floret, faintly 3-ribbed towards the apex, glabrous or slightly scabrous, pubescent towards the apex, terminated by an awn of about twice its own length, a little shorter than that of the central floret, but much exceeding those of the glumes.

On dry banks by roadsides and in waste places, especially in the neighbourhood of towns and villages, and by the sea. Common and generally distributed in England and the south-east of Scotland. North of the Forth it is nearly restricted to the coast, extending to Kincardineshire, and as an introduced plant to Aberdeen and Moray. Very rare in Ireland, and confined to the south and east of the island. "Only in and about towns and buildings, possibly introduced" ("Cyb. Hib.").

England, Scotland, Ireland. Biennial or Annual. Early Summer to Autumn.

Usually biennial, but occasionally annual from plants springing from early ripened seeds, and flowering during the first year. Stems numerous, 6 inches to 2 feet high, weak, usually geniculate for about half their length, flowering in long succession. Leaves 2 to 6 inches long by $\frac{1}{4}$ to $\frac{1}{2}$ inch broad. Spikes 2 to 4 inches long, perfect floret $\frac{5}{12}$ to $\frac{1}{2}$ inch long. Lateral florets $\frac{5}{12}$ to $\frac{3}{5}$ inch long, exclusive of the awns; fertile spikelet $1\frac{1}{4}$ to 2 inches long, including the awn.

This can scarcely be confounded with H. pratense, for, irrespective of the characters derived from the glumes, pales, and awns, it may be recognised by the root not being perennial, without barren shoots, by its broader and more flaccid leaves, the uppermost leaf usually much nearer the panicle and with the sheath more inflated, by the spike being larger and much broader in proportion, with much longer and with less diverging awns, and by the whole plant having a glaucous tinge.

Wall Barley.

French, *Orge queue de rat.* German, *Mäuse Gerste.*

SPECIES IV.—HORDEUM MARITIMUM. *With.*

PLATE MDCCCXXIII.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CXVII. Fig. 250.
Billot, Fl. Gall. et Germ. Exsicc. No. 1369.

Biennial or annual, without barren shoots. Flowering stems erect from the base, or erect or ascending from a longly geniculate base; knots glabrous. Leaves rather firm, narrowly linear, tapering from the base to the apex, with numerous slender approximate scabrous nearly-equal ribs, pubescent with very short stiff hairs, pale glaucous-green; lowest sheath puberulent, with very short reflexed hairs, or glabrous, all except the lowest one always glabrous; ligule very short, truncate. Spike erect, oblong-linear or oblong, usually narrowed upwards, cylindrical-tetragonal, slightly compressed, glaucous-green. Spikelets ascending, the lowest ones often spreading and diverging widely from the rachis, in threes, the lateral ones male, the central one perfect. Glumes of the central floret cylindrical-setaceous, attenuated into awns about twice their own length, not ciliated or scabrous: inner glume of the lateral florets half oval-lanceolate, curved towards the side of the central floret, and nearly straight on the side next the outer glume of the spikelet to which it belongs, terminated by an awn about twice its own length, and a little longer than that of the central spikelet, not ciliated or glabrous: outer glume of the lateral spikelets setaceous and awn-like throughout, scabrous, with the point of its awn equalling that of the central floret, and consequently a little shorter than that of the inner glume of the lateral spikelet. Florets all nearly sessile within their glumes. Lower pales of all the florets elliptical-linear, entire, indistinctly 3-ribbed towards the apex, and glabrous: that of the central floret with a stout awn nearly twice its own length, and a little longer than that of its own glumes, and equalling that of the inner glume of the lateral spikelets: lower pale of the lateral florets with an awn of about its own length, and scarcely half as long as that of the central floret.

In salt marshes and in meadows by the sea and tidal rivers, and on embankments and by roadsides in such localities. Rather frequent and generally distributed in the south of England, reaching north to Cheshire and Northumberland. It has been reported from Kincardine on Forth, Clackmannanshire, but doubtless introduced, and from Forfarshire, where H. murinum was mistaken for it. In Ireland the authors of the "Cybele Hibernica" believe that it does not occur, and that a similar mistake of nomenclature has occurred.

England [Scotland]. Biennial. Early Summer to Midsummer.

Stems 2 to 18 inches high or long, erect and few when the plants grow very close together, but decumbent for half their length, and very numerous and usually shorter when the individuals are isolated. Leaves $\frac{1}{2}$ to 3 inches long by $\frac{1}{8}$ to $\frac{1}{6}$ inch broad, the uppermost stem leaf ½ to 1 inch long, and usually broader than the others; uppermost sheath greatly swollen. Spikes ¾ to 2 inches long. Spikelets ¼ inch long without the awn. Fertile floret ⅝ to ¾ inch long, including the awn.

Resembles H. murinum, but with narrower and firmer leaves, shorter and narrower spikes, with more rigid and much more diverging awns, but best known by the unilateral wing-like development of the inner glume of the lateral florets.

Sea-Barley.

German, *Meerstrands Gerste.*

TRIBE I. (*bis*).*—NARDEÆ.

Spikelets closed during flowering, sessile, arranged in 2 unilateral rows in a simple spike, the rachis of which is excavated to receive them, and has at each notch a single spikelet containing 1 perfect floret. Glumes absent. Style short; stigma 1, very long, protruded at the apex of the florets between the tips of the pales. Caryops linear-trigonous, with a furrow on the inner face.

GENUS I.(bis).—**NARDUS.** *Linn.*

Spikelets quite sessile, solitary, arranged in 2 rows in a unilateral simple spike, closed during flowering, each containing a single perfect floret. Glumes absent. Pales 2, the lower one subulate, keeled, awned, parchment-like; upper pale entire, obtuse, 2-ribbed. Lodicules absent. Stamens 3. Style 1, terminal, terminated by a single long slender pubescent stigma, protruded at the apex of the floret between the tips of the pales. Caryops free, glabrous, linear, trigonous, channelled on the inner face.

Greek νάρδος, some plant with a penetrating odour. Why applied to this scentless grass, it is difficult to say.

SPECIES I.—**NARDUS STRICTA.** *Linn.*

PLATE MDCCCXXIV.

Reich. Ic. Fl. Germ. et Helv. Vol. I. Tab. CLXX. Fig. 450.
Billot, Fl. Gall. et Germ. Exsicc. No. 189.

The only known species.

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* This tribe ought to come immediately before *Spartineæ.*

On heaths, moors, and in sterile pastures, especially in upland districts. Locally common and widely distributed.

England, Scotland, Ireland. Perennial. Summer.

Densely cæspitose, each tussock consisting of numerous tufts densely arranged in a chordorrhizal manner; each tuft is enveloped at the base by a few dilated lanceolate leafless sheaths, so as to be somewhat bulbous, and to bear some resemblance to those of Juncus squarrosus in miniature. Leaves chiefly radical, thickly setaceous, rigid, 2 to 9 inches long, spreading; sheaths 1 to 4 inches long, those of the radical leaves all of the same length; ligule elongate, truncate on the radical leaves, longer and lanceolate, and bifid on the stem leaves. Flowering stems 4 to 18 inches long, wiry, usually leafless above the level of the sheaths of the radical leaves, but sometimes with a single leaf similar to the radical ones, but smaller and scarcely so long as its sheath, which is split only at the apex. Spikes 1½ to 4 inches long, unilateral. Spikelets adpressed to the rachis, distichously unilateral, each with a minute scale at the base, probably representing an abortive bract, for, from its position opposite the lower pale, it cannot be the outer glume, as in that case the inner glume would be entirely abortive, while, so far as I know, if there be but one glume present, it is always the inner one, and besides, there is no appearance of articulation of this scale to the rachis. Spikelets purple, about ¼ inch long, exclusive of the awn, which is from ⅙ to ⅛ inch more. Lower pale subulate, acuminate, semicylindrical, scabrous on the edges, and terminated by a short scabrous awn. Upper pale linear, erose at the apex, not awned, hyaline, nearly as long as the lower (exclusive of its awn), entire. Anthers very pale yellow. Style solitary, slender, greatly protruded beyond the pales.

Mat-Grass.

French, *Nard roide.* German, *Steifes Borstengras.*

EXCLUDED SPECIES.

DIGITARIA SANGUINALIS. *Pal. de Beauv.*

An introduced casual, not persistent in its stations and less so than formerly, for it appears to have been at one time found year after year in Battersea Fields.

DIGITARIA CILIARIS. *Pal. de Beauv.*

Near Bury, Lancashire, Dr. Carrington.

PANICUM MILIACEUM. *Linn.*

On rubbish heaps, chiefly about London, but not established.

SETARIA ITALICA. *Pal. de Beauv.*

Occasionally about London, doubtless scattered with the refuse of birdcages, being often given to birds under the name of Italian millet.

SETARIA GLAUCA. *Pal. de Beauv.*

In waste places. It has occurred in Surrey, Sussex, Middlesex and Hants. In 1853 it was abundant on the mud dredged from the Thames and laid on Battersea Fields. It is liable to be passed over when young as S. viridis, for it is only as the fruit ripens that the involucral bristles assume their characteristic orange tinge, and the lower pale shows the transverse wrinkles which distinguish it from S. viridis.

PHALARIS PARADOXA. *Linn.*

In corn-fields at Swanage, Dorset, found by Mr. Hussey, but it has not, I believe, occurred since 1851. It has also been found near Huddersfield, introduced with foreign wool, but the plants in that locality scarcely deserve to be mentioned any more than those from the distillery refuse of Wandsworth and Mitcham.

PHLEUM MICHELII. *All.*

Said to have been found on the summit of the highest mountains in Forfarshire by G. Don, but by no one else. Mr. H. C. Watson suggests that possibly the long-awned form of Alopecurus alpinus, to which I have given the name Watsoni, may have been mistaken for it.

PHLEUM ASPERUM. *Jacq.*

Reported from Somerset, Gloucester (believed to be an escape from the Duchess of Portland's garden at Badminton), Oxford, Cambridge (confounded with P. Böhmeri), and Bedford (an error), but it has not been found in any of these counties recently. I possess specimens said to have been collected at Cobham, Kent, by Mr. William MacIvor in July 1846, but no one else has been able to find it there.

PHLEUM TENUE. *Schrad.*

A weed in a bed of onions at Thirsk, Yorkshire, found by Mr. J. G. Baker.

PSAMMA BALTICA. *Röm. & Schultes.*

Ross Links, north-east of Belford, Northumberland. Mr. William Richardson in "Journ. Bot." Jan. 1872, p. 21. I have not seen any specimen, but the name is authenticated by Dr. Trimen, who, however, judiciously says, "Further examination of the station will, however, be desirable before we publish a figure and full description of A(mmophila) Baltica as a British plant."

STIPA PENNATA. *Linn.*

Said to have been found in Ken (Caen) Wood, Hampstead, London (an impossible station); Rumbold's Moor, Yorkshire, by Samuel Gibson (an unreliable authority). Long Sleadale, about six miles north of Kendal, Westmoreland, Dr. Richardson and Mr. Lawson (from a garden?). Mr. J. Tatham says in a letter to Mr. H. C. Watson, that he has wild specimens gathered in Westmoreland by the late J. Gough, of Kendal, "Comp. Cyb. Brit." p. 593. So very conspicuous a grass could scarcely be overlooked by modern botanists, so that no doubt there has been some error or imposition in saying it occurred wild in England.

AVENA SUBSPICATA. *Link.*

"In Alpibus Angliæ." *Andersson*, Gram. Scand. p. 69. Unknown as a British plant by the botanists of this country.

AVENA PLANICULMIS. *Schrad.*

Reported from Forfar through mistake of name—A. pratensis var. *alpina*, being so called by Smith; Glen Sannox, on the ascent of Goatfell from Loch Rannock in the Isle of Arran, Mr. Stewart Murray; but Dr. Balfour and others have searched for it there in vain.

SCLEROCLOA DURA. *Pal. de Beauv.*

On ballast, Hartlepool, Durham, Prof. M. A. Lawson; but the Professor has sent to the Botanical Exchange Club specimens of Lolium perenne, with a contracted spike, collected at Gravesend, labelled Sclerocloa dura. Was the Hartlepool plant also Lolium perenne?

ERAGROSTIS POÆOIDES. *Pal. de Beauv.*

In a new made road at Birkenhead, Chester, Mr. F. M. Webb.

POA DISSITIFLORA. *Röm. & Schultes.*

The Rev. W. W. Newbould identifies a Poa from Ben Lawers contained in Smith's Herbarium with P. dissitiflora, *Röm. & Schultes*, on the authority of authentic specimens from Greenland, collected by Hornemann, contained in the Kew Herbarium. From a misapprehension on my part, I believed that Mr. Newbould had identified the plant figured in English Botany by Smith as Poa glauca with P. dissitiflora, but in a subsequent letter Mr. Newbould explains that this is not the fact, so that the name "dissitiflora" on Pl. MDCCLXVI. will be found in the Errata to this volume corrected into "eu-glauca." Being unable at present to visit the Kew Herbarium, I can offer no opinion on the subject, though, from what Mr. Newbould writes, P. dissitiflora must be either the plant I have called P. Balfourii, β. *ambigua*, or P. nemoralis, δ. *glaucantha*. Römer & Schultes' description is insufficient to decide the point.

POA SUDETICA. *Hänke.*

"Kew Grounds, Dr. Hooker, and Warwick, Mr. Kirk." Comp. "Cyb. Brit." p. 594. I have gathered it also in Battersea Fields in 1853, on mud dredged from the Thames; and, in the same year, in the grounds of Chelsea Hospital.

BROMUS TECTORUM. *Linn.*

In waste places near towns and on ballast; but scarcely established, except at Gloucester Docks. Professor Thiselton-Dyer tells me he has met with it on St. Vincent's Rocks, Bristol. The secund panicle and horizontal spikelets at once distinguish it from B. Madritensis.

BROMUS UNIOLOIDES. *Willd.*

Round a partly drained pond in Warwick Old Park, and in a potatoe-field at Woodcourt, Warwickshire, Mr. H. Bromwich; also in a field at Newton in Cleveland, Yorkshire, 1854, Mr. W. Mudd.

BROMUS PATULUS. *Mert. & Koch.*

In waste places near towns and on ballast; apparently established at Gloucester Docks. In 1853 it was plentiful on the mud taken from the Thames and laid on Battersea Fields. Prof. Thiselton-Dyer tells me he has noticed it at Cirencester and on St. Vincent's Rocks. It is said also to have occurred in Yorkshire.

BROMUS SQUARROSUS. *Linn.*

Said to have occurred at Glastonbury, Somerset; and recorded at "Marshfield," (Maresfield?) Sussex, by Hudson. I have myself seen it on the mud from Battersea Fields in 1853, and in the compendium of the "Cybele Britannica," Gloucester and Scotland (?) are mentioned in its distribution.

TRITICUM CRISTATUM. *Schreb.*

Said by George Don to have been found by himself on steep banks and rocks between Arbroath and Montrose, and in the "Cybele Britanica," Mr. H. C. Watson states that in a letter from Sir W. C. Trevelyan, dated August 19, 1839, he remarks that T. cristatum was then "abundant in Lunan Bay, near Arbroath;" but in 1848, Mr. Gardner asserted in his "Flora of Forfarshire" that "Don alone has found it." "Cyb. Brit." Vol. III. p. 237.

ELYMUS GENICULATUS. *Curtis.*

Said to have been found in salt marshes near Gravesend by Mr. Dickson. No doubt there is a well-known garden plant, whose native country is unknown, which was figured by Curtis as his E. geniculatus, but I have little doubt that Dickson saw nothing at Gravesend but the leaves of Triticum pungens, and distributed the garden plant under the belief that it was the same as he had seen growing wild, as he did with several other species. In the compendium of the "Cybele" Mr. Watson says, "near Greenwich or Gravesend, Kent," but Curtis and Smith mention Gravesend only.

LOLIUM MULTIFLORUM. *Lam.*

A sub-species of L. perenne, or perhaps a cultivated annual variety of L. Italicum. I gathered it in 1853 on the mud taken from the Thames at Battersea, and the plant has probably occurred elsewhere, but may not have been distinguished from L. Italicum.

LOLIUM LINICOLA. *Sonder.*

A weed in flax-fields introduced with foreign seed. Bognor, Sussex, Dr. Mateer; Hurstpierpoint, Sussex, Mr. W. Mitten. Godalming, Surrey, Mr. J. D. Salmon; Catterick Bridge, Yorkshire, Mr. J. Ward; Newtonards, Rev. E. F. Linton.

LEPTURUS INCURVATUS. *Trin.*

This plant, distinct as a sub-species (or possibly even only as a variety) from L. filiformis, has been found on ballast heaps at St. David's, Fife, but not recently I believe.

Several other grasses, as Elusine Indica, *Gärtn.*, Chloris compressa, *Nees*, Lappago racemosa, *Willd*, Crypsis aculeata, *Ait.*, and Ægilops ovata, *Linn.*, have occurred among wool or distillery refuse, or on that from oil-mills, but do not deserve a special detailed notice.

ERRATA.

Page 2 *after* line 29 *insert* Oryza clandestina, *A. Braun; Garcke*, Fl. v. Nord-und Mitt.-Deutschland, ed. vi. p. 440.

,, 25 line 1 *after* geniculatus add *Linn.*

,, 28 ,, 39 for *Linn.* read *Smith*

,, 38 ,, 25 ,, *Nilgrass* ,, *Nitgrass*

,, 43 ,, 29 ,, Spica venti. ,, Spica venti,

,, 44 ,, 13 ,, least ,, lesser.

,, 63 *after* line 12 *insert* Weingärtneria canescens, *Bernh. Garcke*, Fl. v. Nord-und Mitt.-Deutsch. ed. vi.

,, 64 *after* line 16 *insert* Deschampsia cæspitosa, *Pal. de Beauv. Gren. & Godr.* Fl. de Fr. Vol. III. p. 507. *Parl.* Fl. Ital. Vol. I. p. 241. *Kunth*, Enum. Plant. Vol. I. p. 286. *Röm. & Schultes*, Syst. Veg. Vol. II. p. 685.

,, 75 line 26 *for* MDCCXXXIX, MDCCXL. *read* MDCCXXXVIII, MDCCXXXIX.

,, 76 ,, 8 ,, MDCCXXXIX. ,, MDCCCXXXVIII.

,, 76 ,, 15 ,, MDCCXL. ,, MDCCCXXXIX.

,, 78 ,, 29 *dele* Potatoe Oat.

,, 80 *after* A. sativa *add* and the Potatoe Oat, A. nuda.

,, 80 line 25 *after* vars. *read* varieties of A. fatua.

,, 82 ,, 12 for *Wild.* ,, *Willd.*

,, 82 ,, 19 ,, *Wild.* ,, *Willd.*

,, 82 ,, 20 ,, *Presl.* ,, *Presl*;

,, 83 ,, 29 after MOLLIS add *Linn.*

,, 90 ,, 37 for *Dumort*, read *Dumort.*

,, 92 ,, 16 ,, Montana ,, montana

,, 97 ,, 5 ,, *Fries.* ,, *Fries*;

,, 97 *after* line 5 *insert* Poa fluitans, *Hook. & Arn.* Brit. Fl. ed. viii. p. 548.

,, 97 line 18 for *Townsend.* read *Townsend*,

,, 98 ,, 18 ,, G. ,, Poa

,, 105 ,, 27 ,, *Fries.* ,, *Fries*;

,, 108 ,, 2 ,, widely distributed in the south and east of *read* Cork and Belfast, but doubtfully native in

,, 108 ,, 3 *after* IRELAND *add* ?

,, 111 ,, 15 *for* III. *read* XXXIV.

,, 112 last line, *for* stolons *read* branches.

,, 124 *after* line 9 *insert* P. Parnellii, *Bab.* Eng. Bot. Suppl. No. 2916, and Man. Brit. Bot. ed. vi. p. 413.

,, 128 line 1 *for* subcœrulea *read* subcærulea

,, 128 ,, 3 ,, subcœrulea ,, subcærulea

,, 133 ,, 33 *dele* annotinous

On Plate MDCCI. *for* eu-geniculatus *read* geniculatus

On ,, MDCCLXVI. ,, dissitiflora ,, eu-glauca

On ,, MDCCCIII. ,, racemosus ,, eu-racemosus

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[Species in CAPITALS, Sub-species and Excluded Species in small letters, and Synonyms in *italics*.]

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LONDON
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AND PARLIAMENT STREET

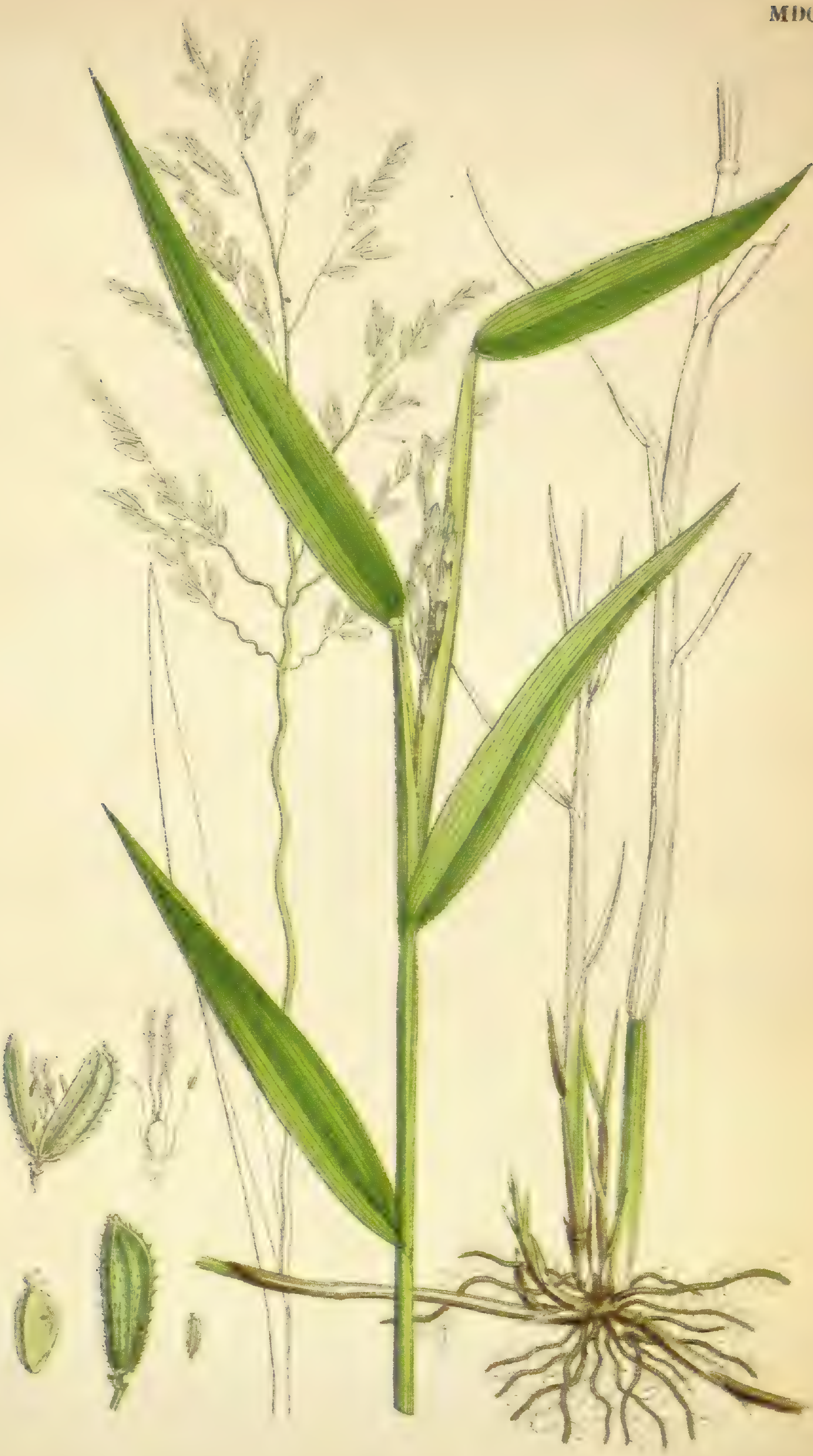
ENGLISH BOTANY.

ILLUSTRATIONS.

ENGLISH BOTANY.

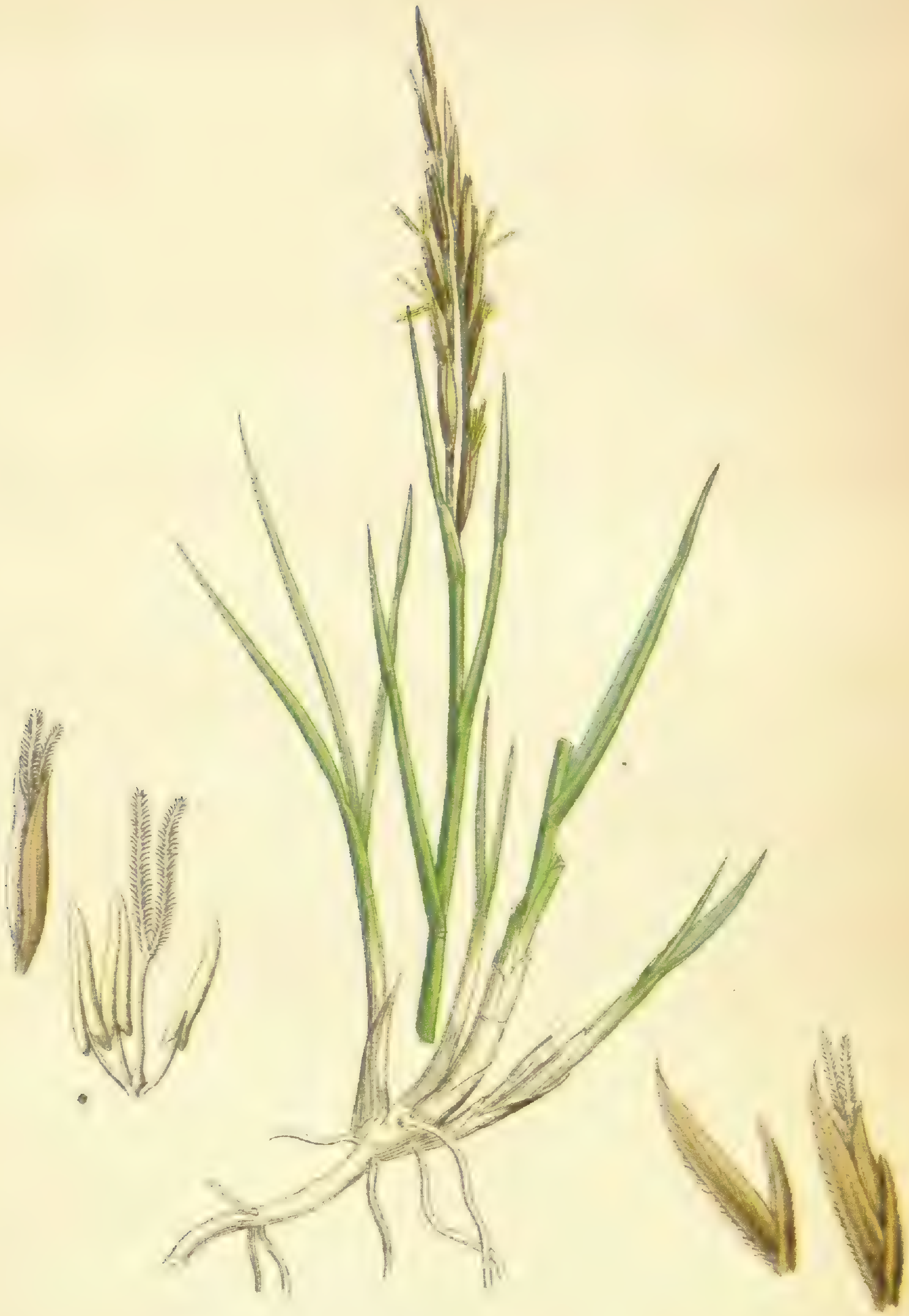
ILLUSTRATIONS.

MDCLXXXVI.



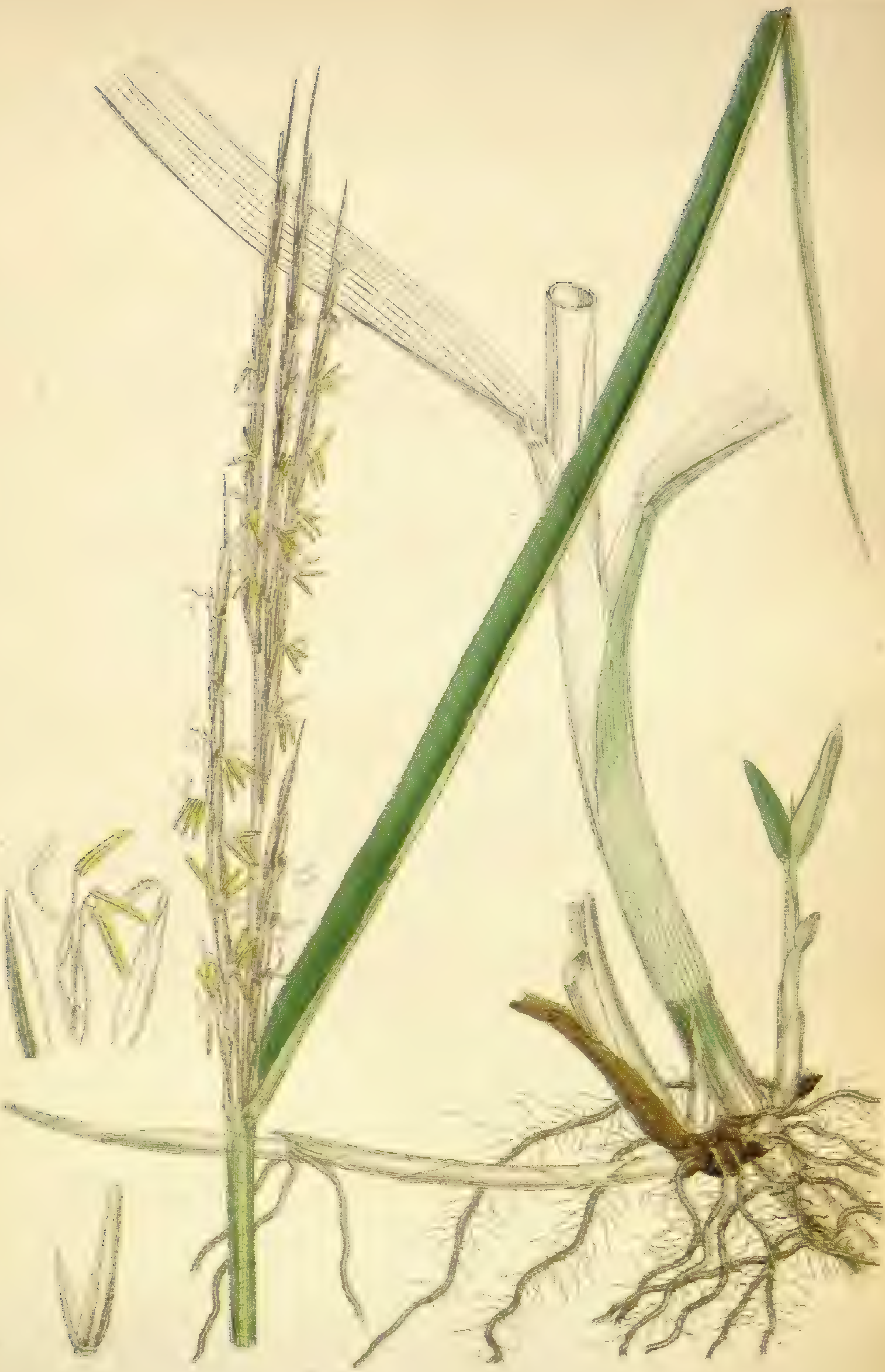
E. B. S. 2908.

Leersia oryzoides. European Cut-grass.



E. B. 380.

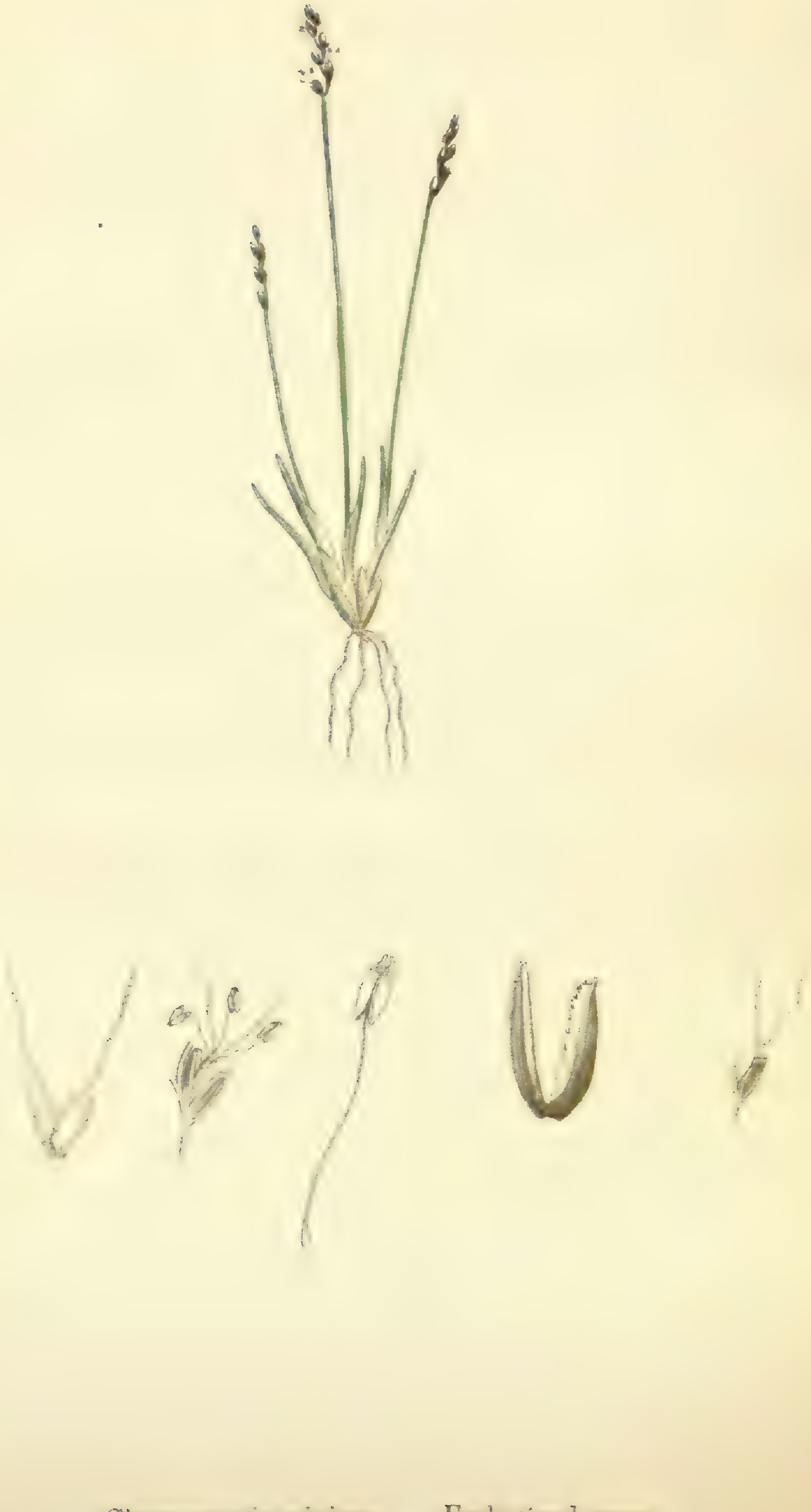
Spartina stricta   Twin-spiked Cord-grass.



E. B. S. 2812

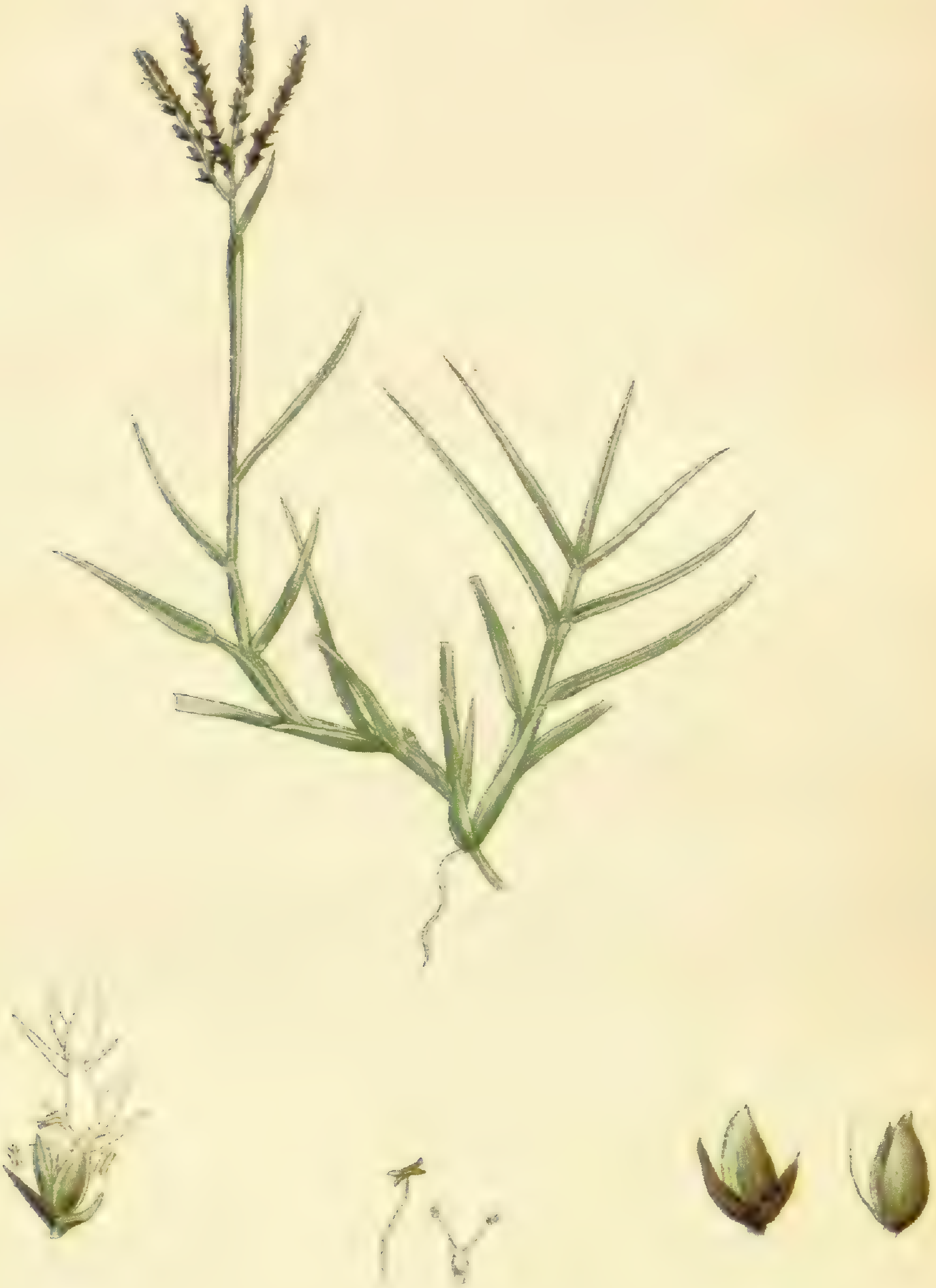
Spartina alterniflora. Many-spiked Cord-grass.

MDCLXXXIX



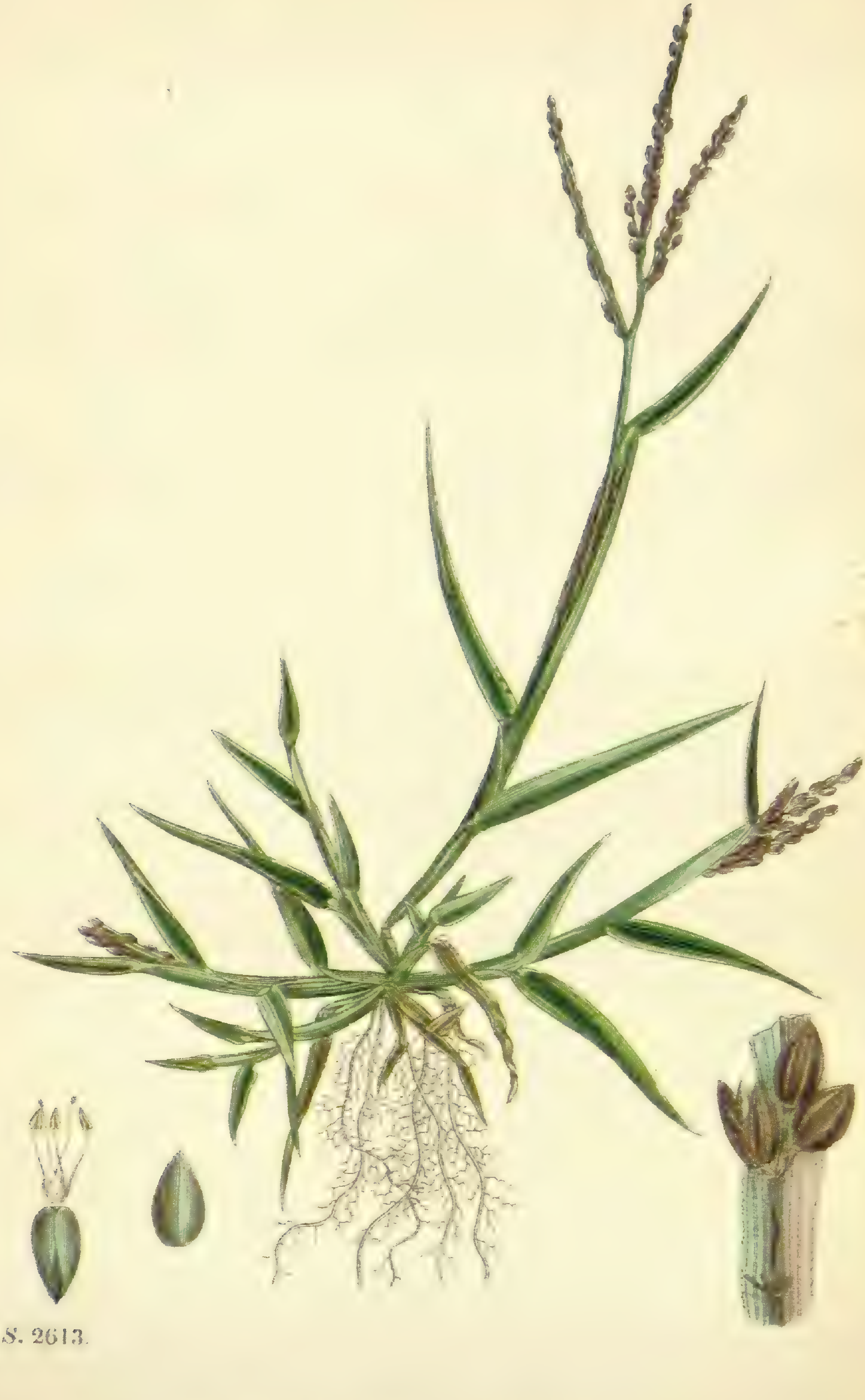
E. B. 1127.

Chamagrostis minima. Early Sand-grass



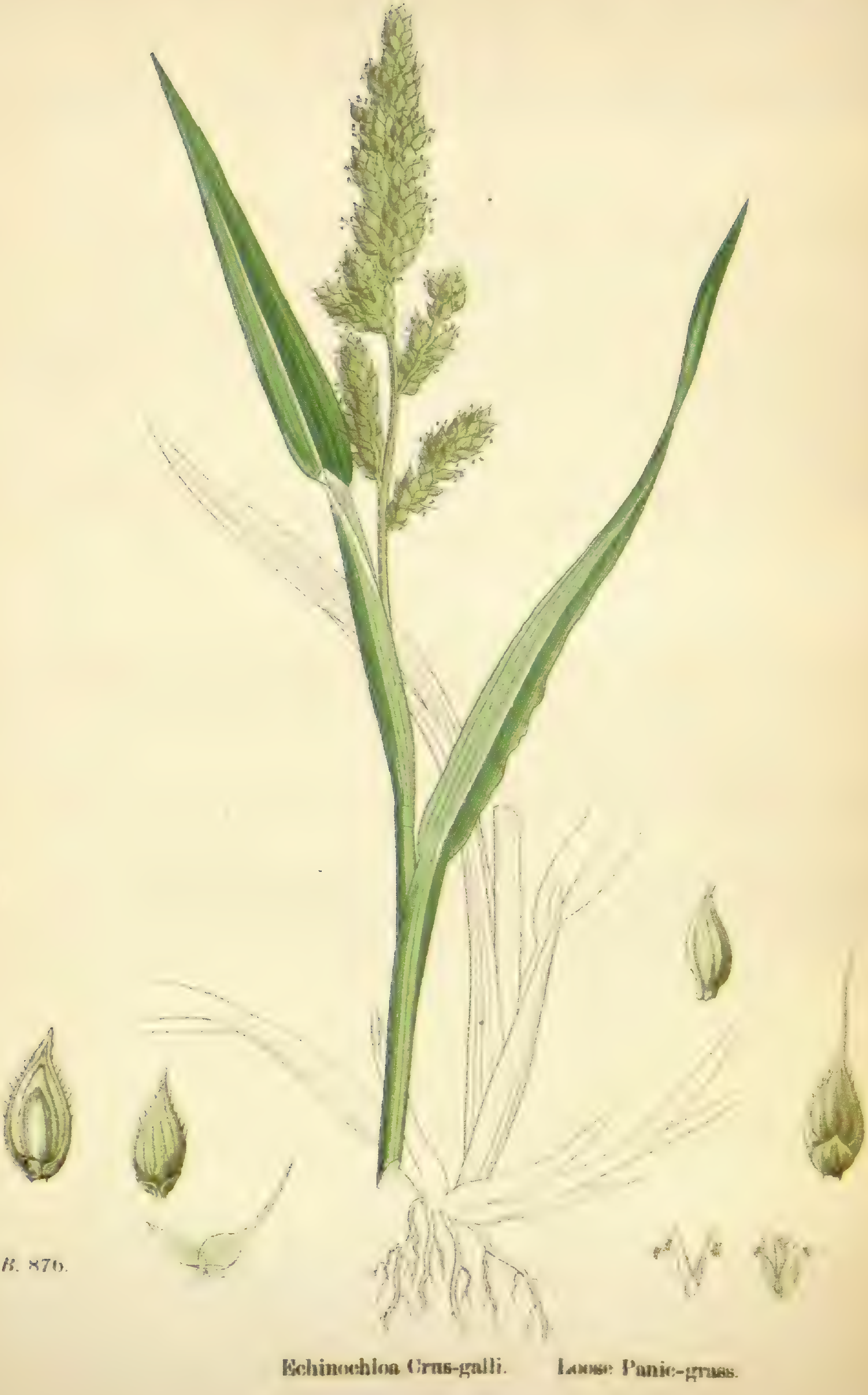
E. B. 850.

Cynodon Dactylon. Creeping Dog's-tooth-grass.



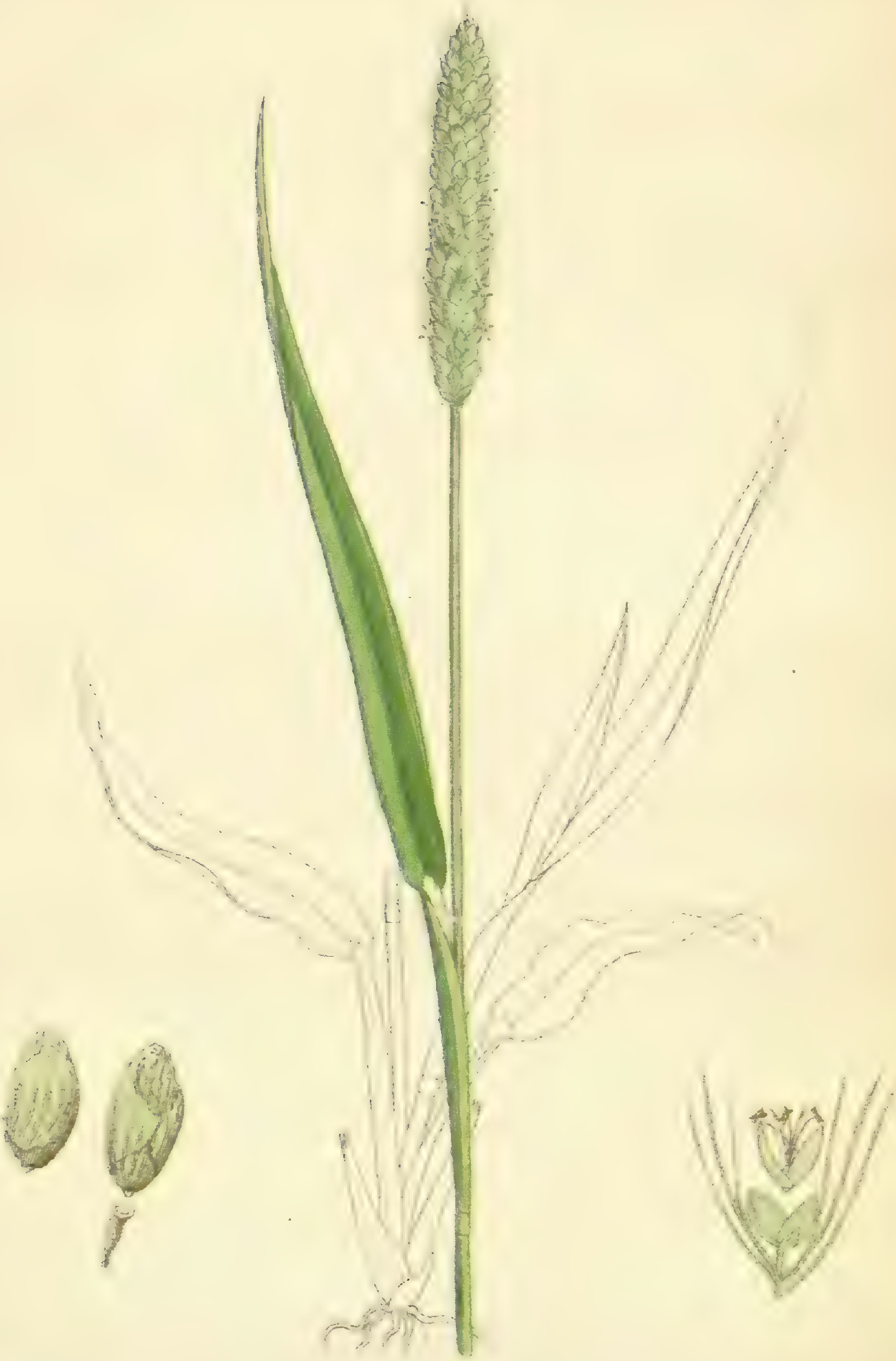
E. B. S. 2613.

Digitaria humifusa. Glabrous Finger-grass.



E. B. 876.

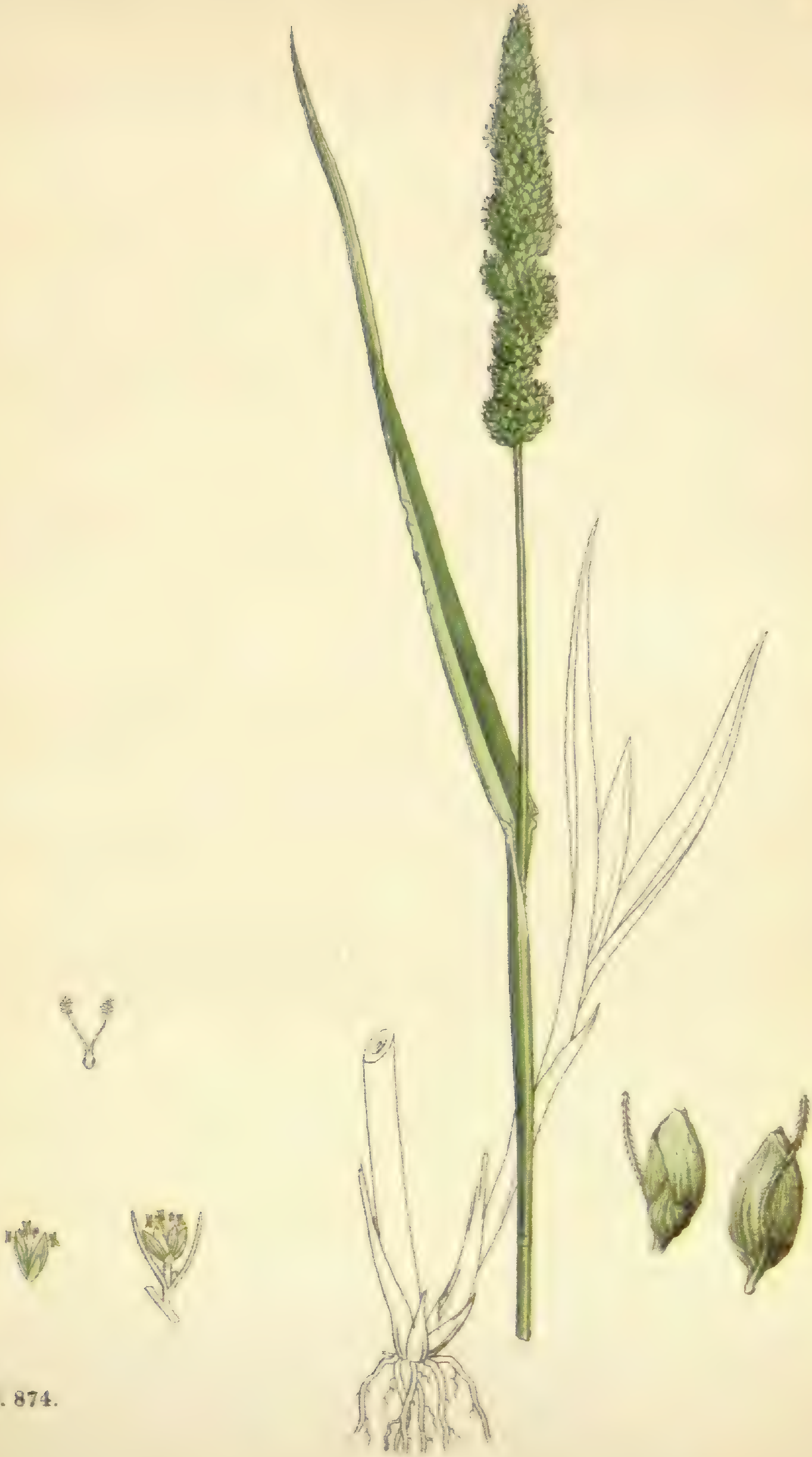
Echinochloa Crus-galli. Loose Panic-grass.



E. B. 875.

Setaria viridis. **Green Bristle-grass.**

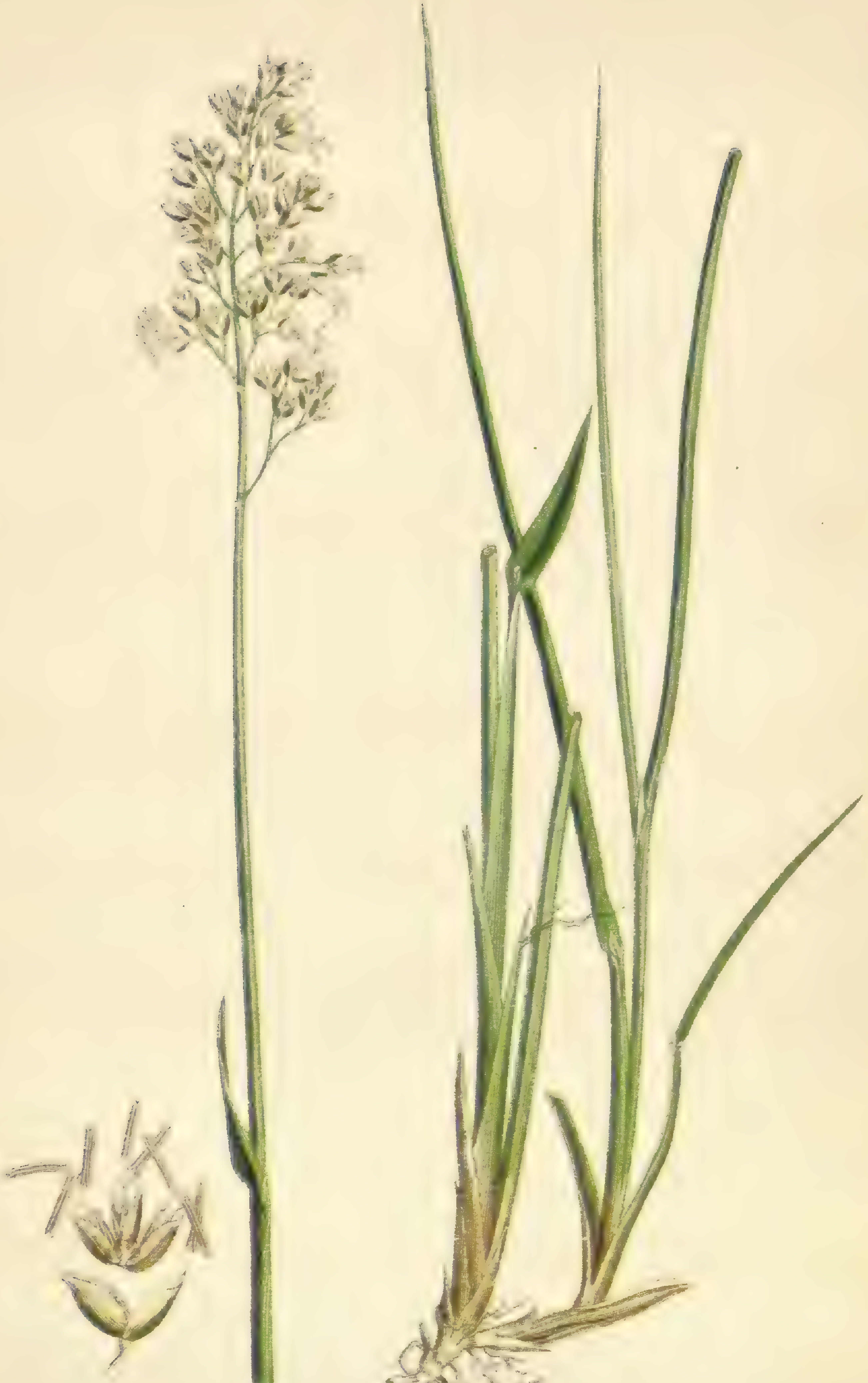
MDCXCIV.



E. B. 874.

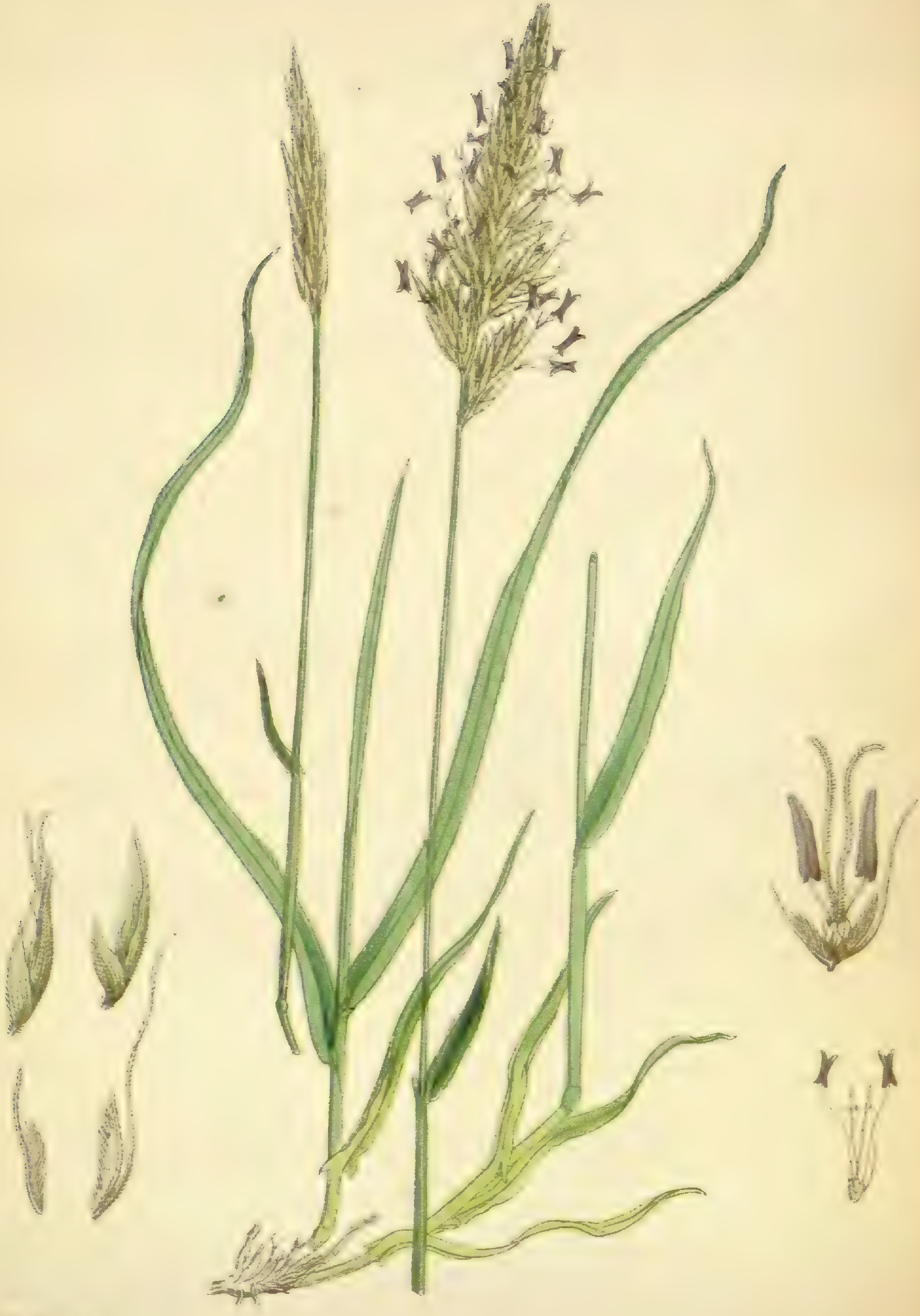
Setaria verticillata. Rough Bristle-grass.

MDCXCV.



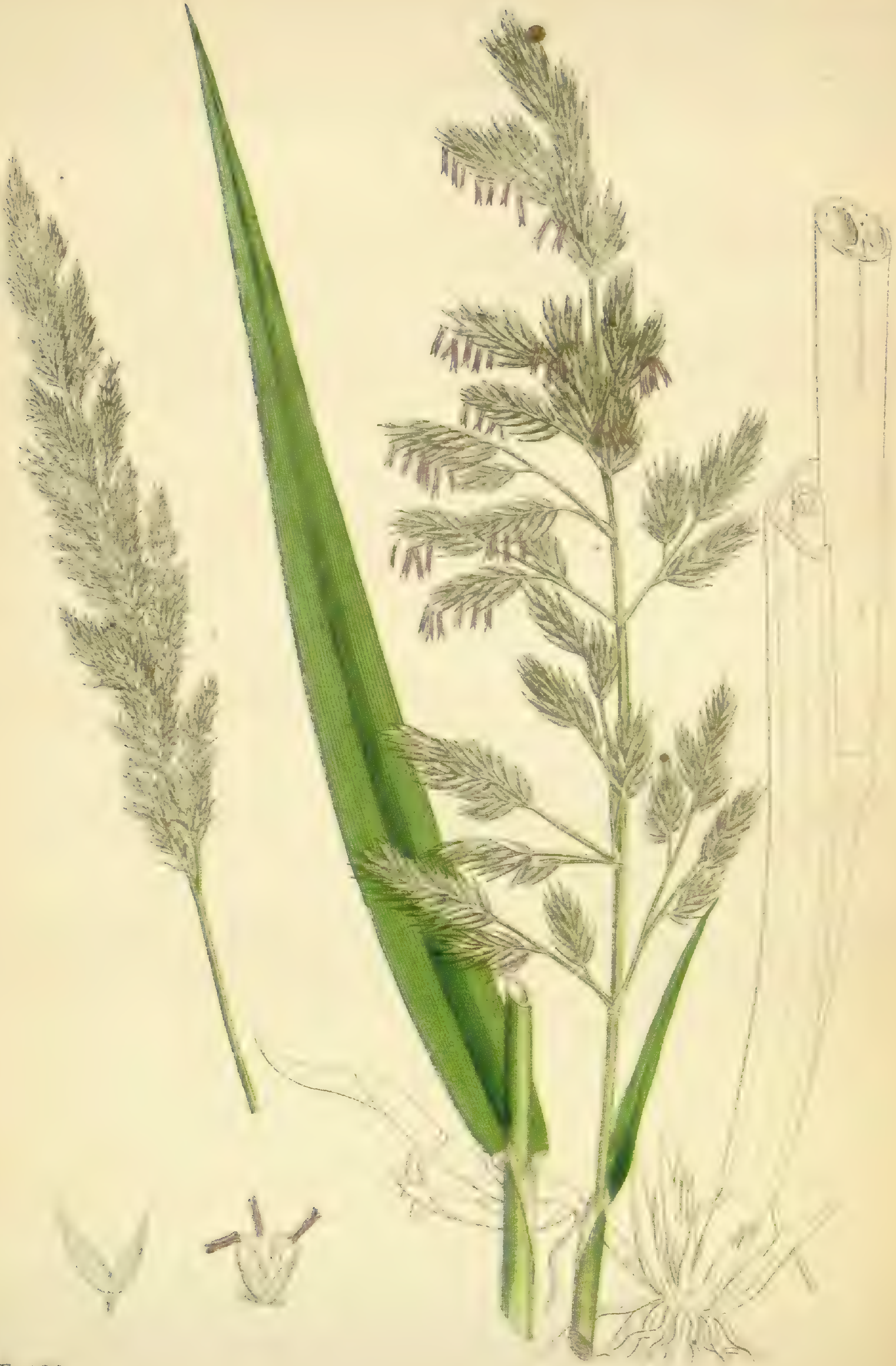
E. B. S. 2641.

Hierochloe borealis. Northern Holy-grass.



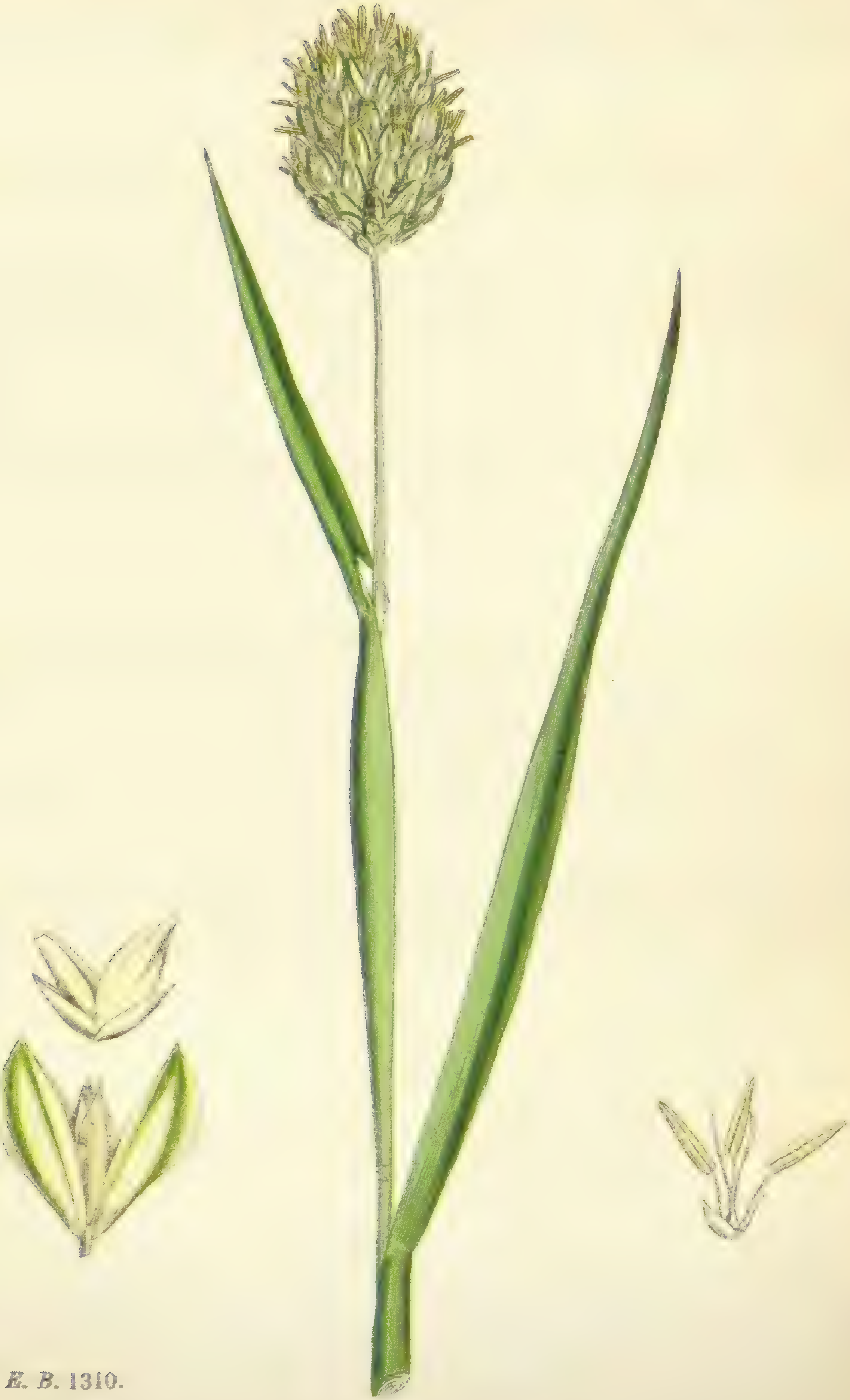
E. B. 647

Anthoxanthum odoratum. Sweet-scented Vernal-grass.



E. B. 402.

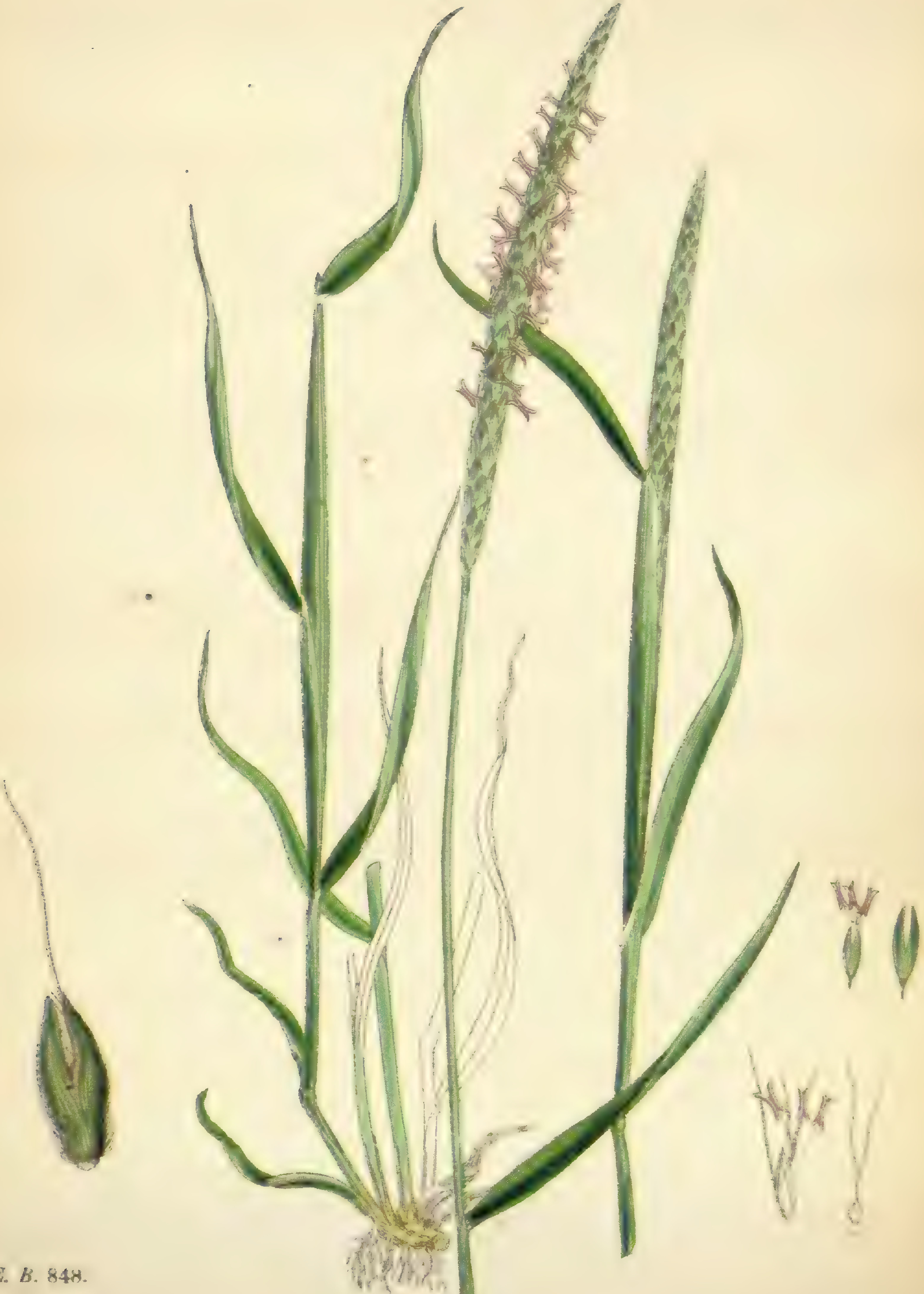
Digraphis arundinacea. Ribbon-grass.



E. B. 1310.

Phalaris canariensis. Canary-grass.

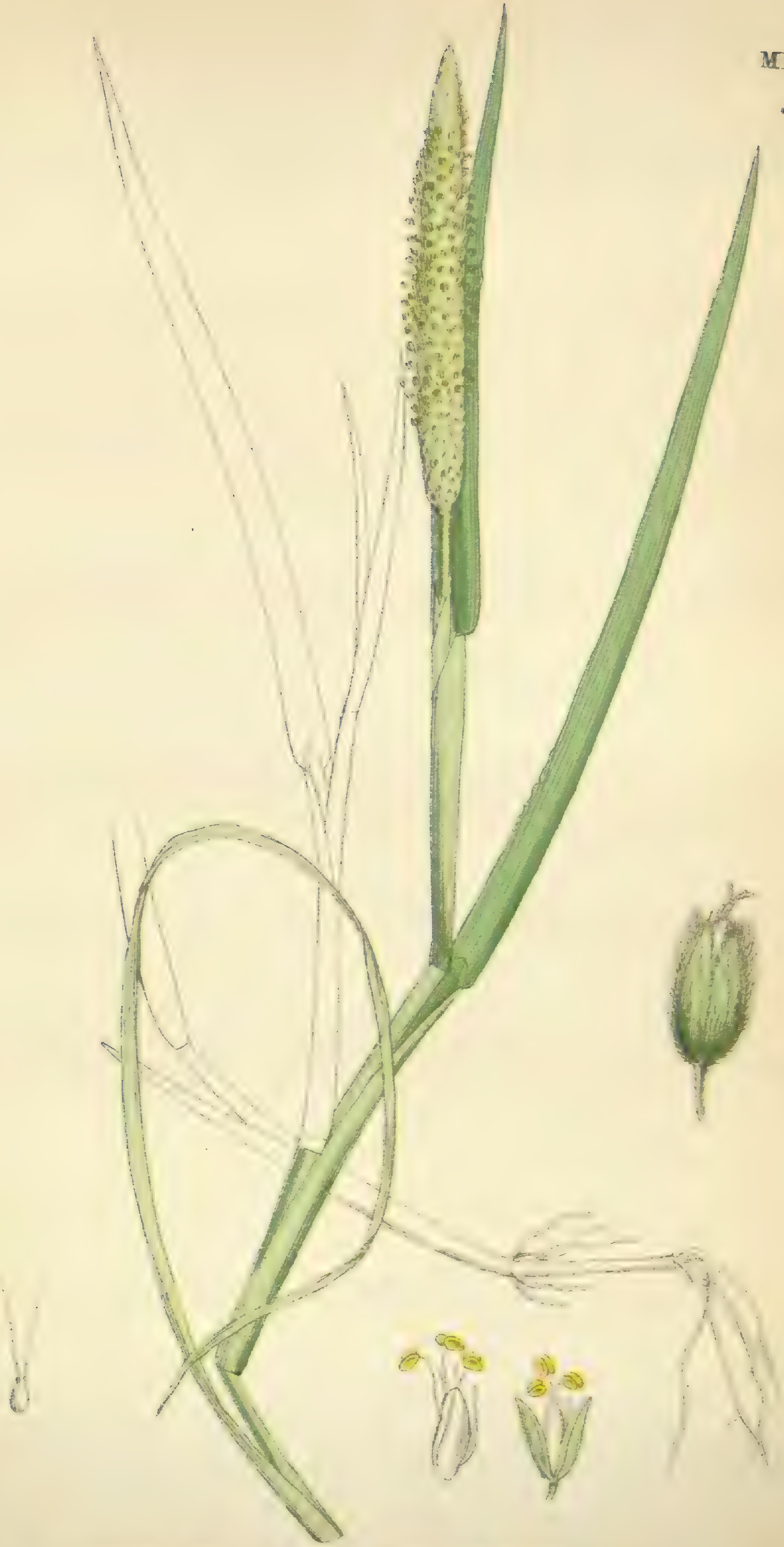
MDCXCIX.



E. B. 848.

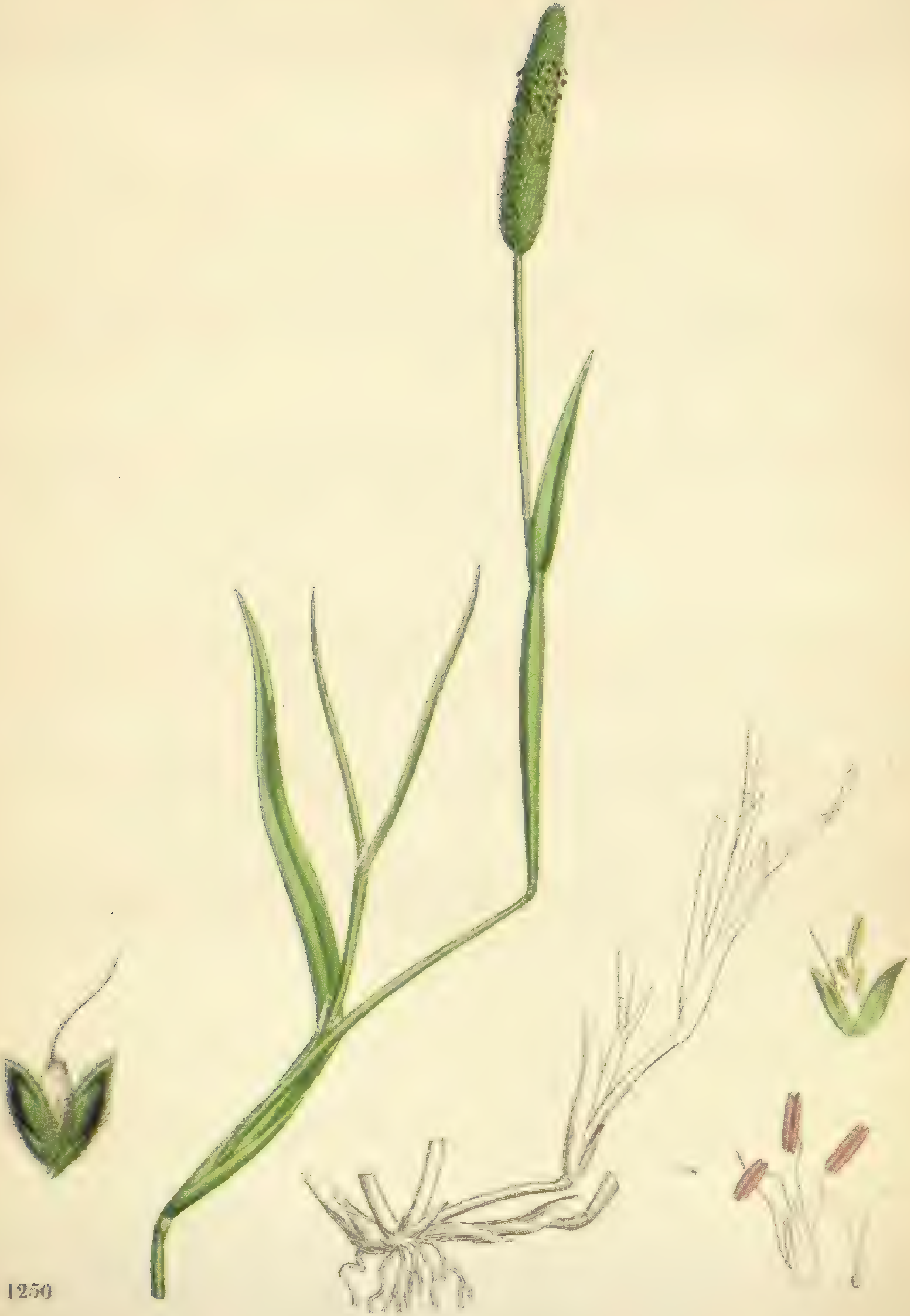
Alopecurus agrestis. **Slender Fox-tail-grass.**

MDCC.



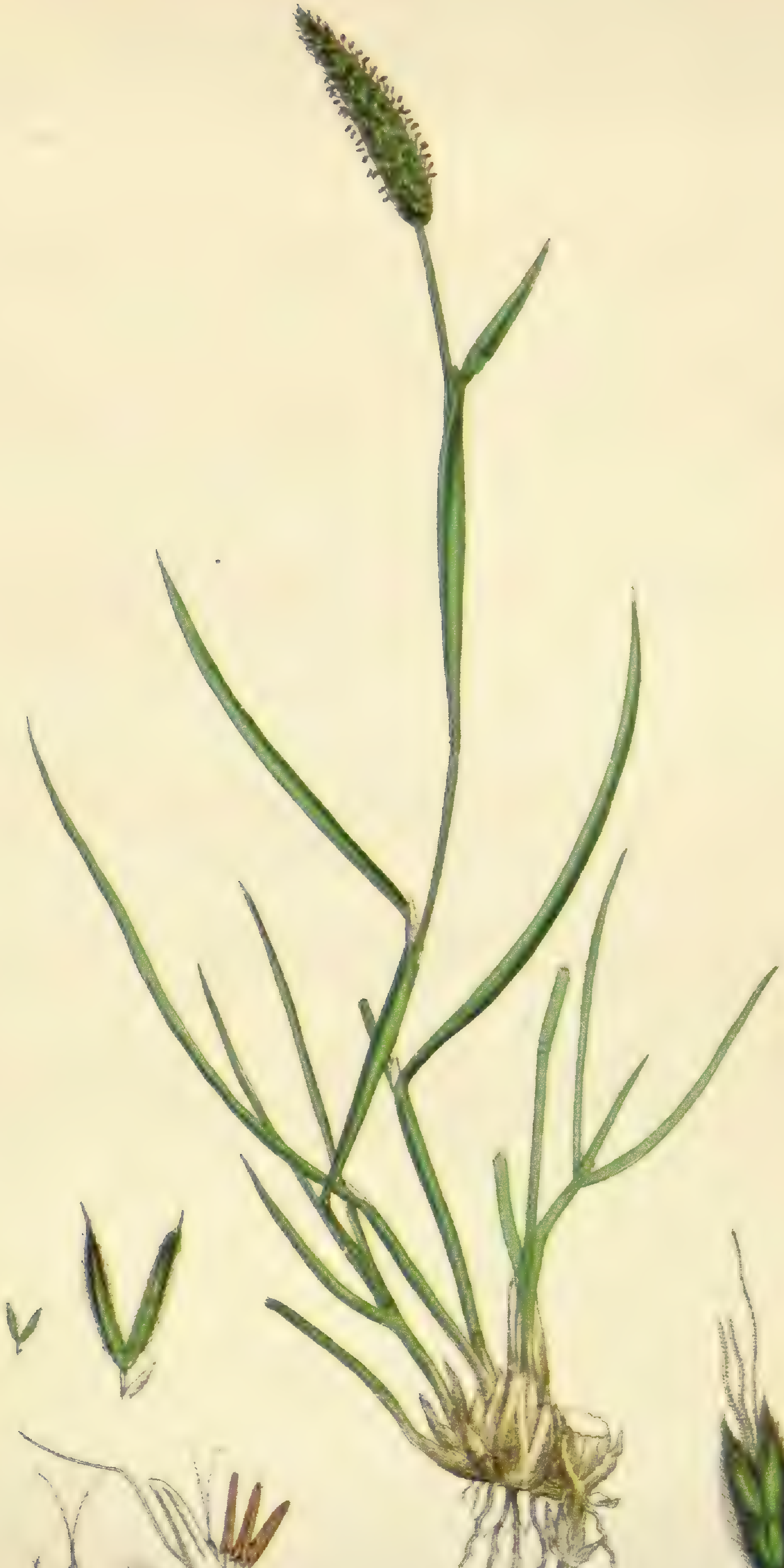
E. B. 1467.

Alopecurus fulvus. Orange anthered Fox-tail-grass.



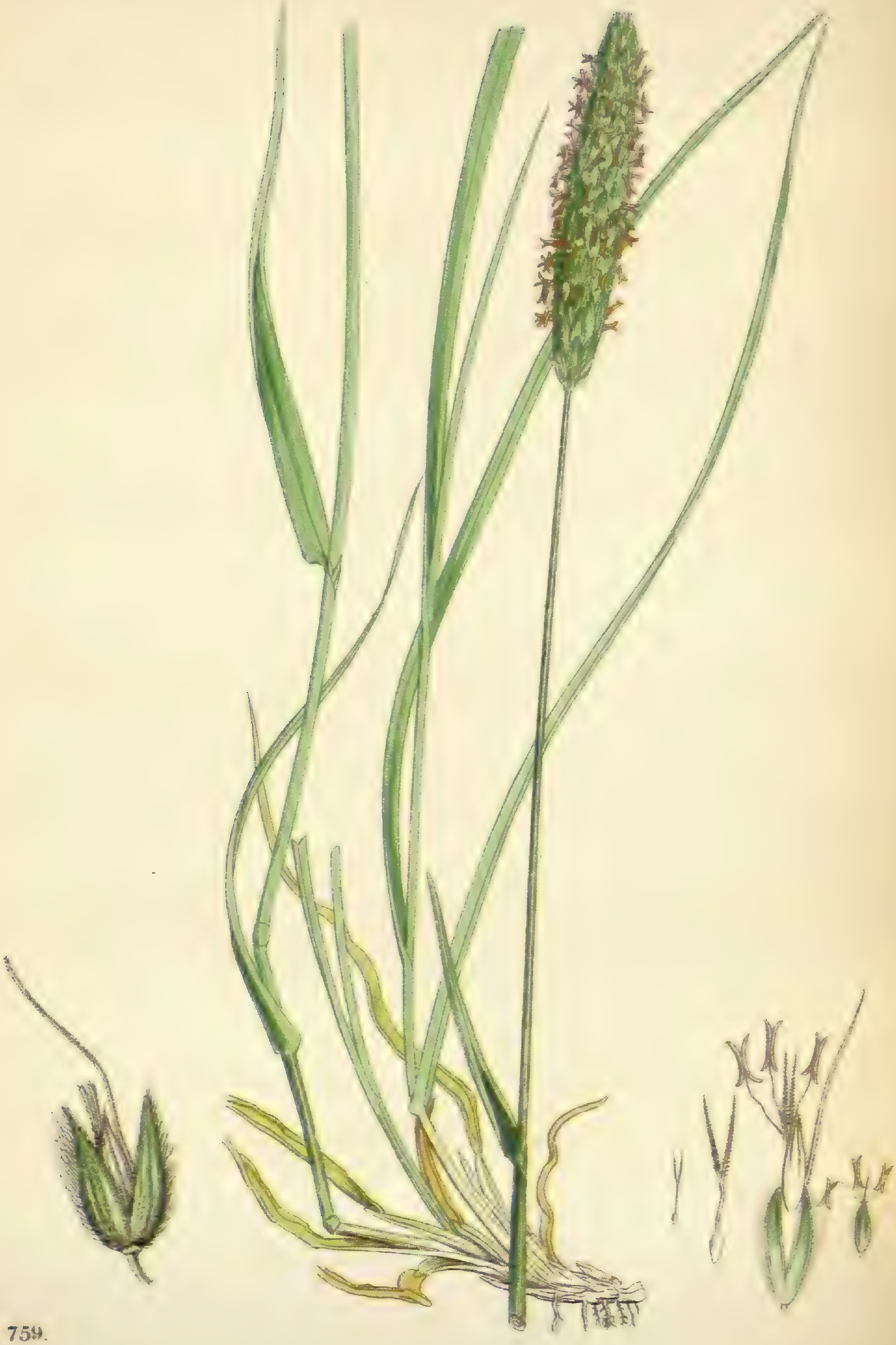
E. B. 1250

Alopecurus eu-geniculatus. **Bent-stemmed Fox-tail-grass.**



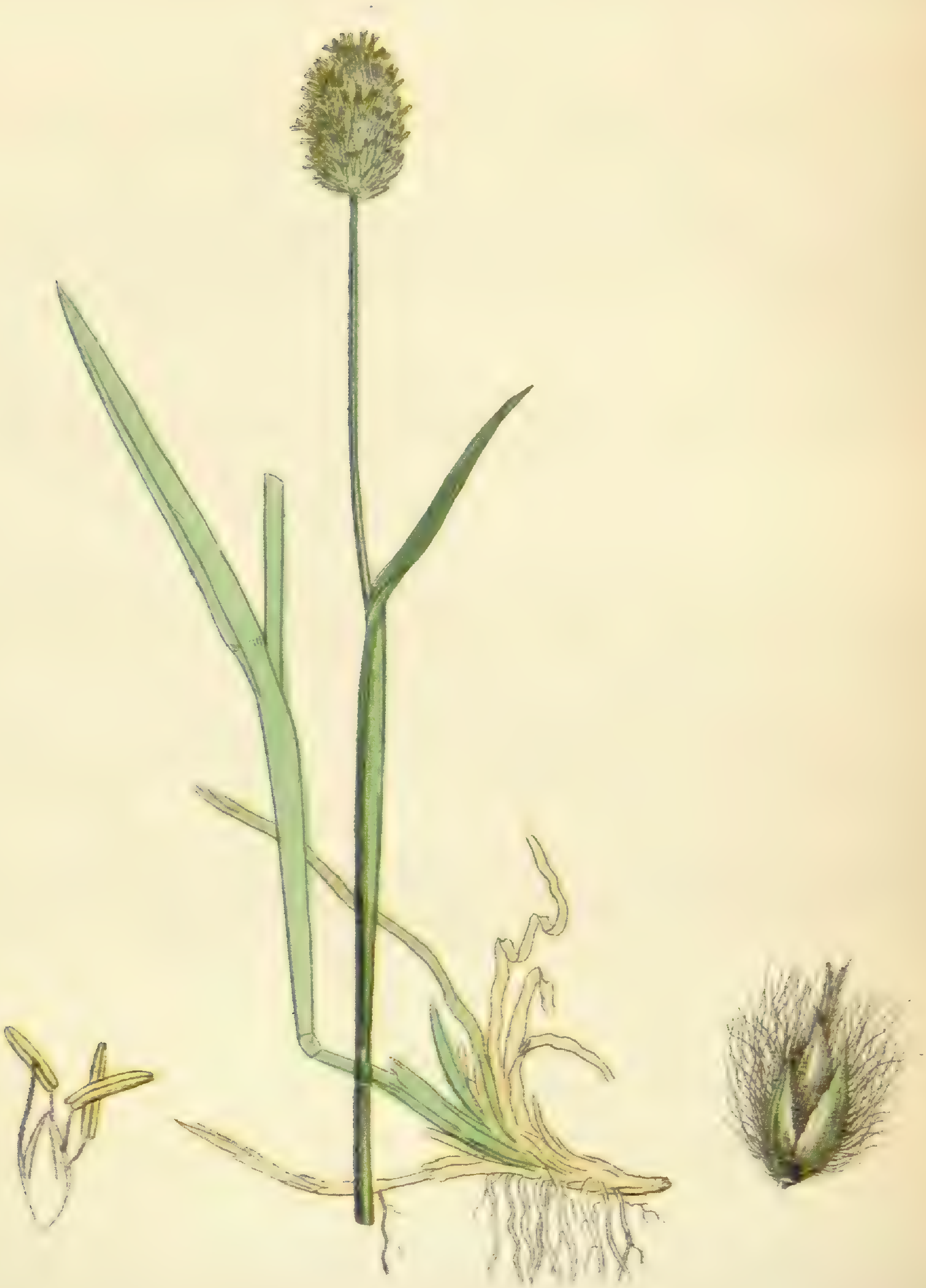
E. B. 1249.

Alopecurus bulbosus. Tuberous Fox-tail-grass.



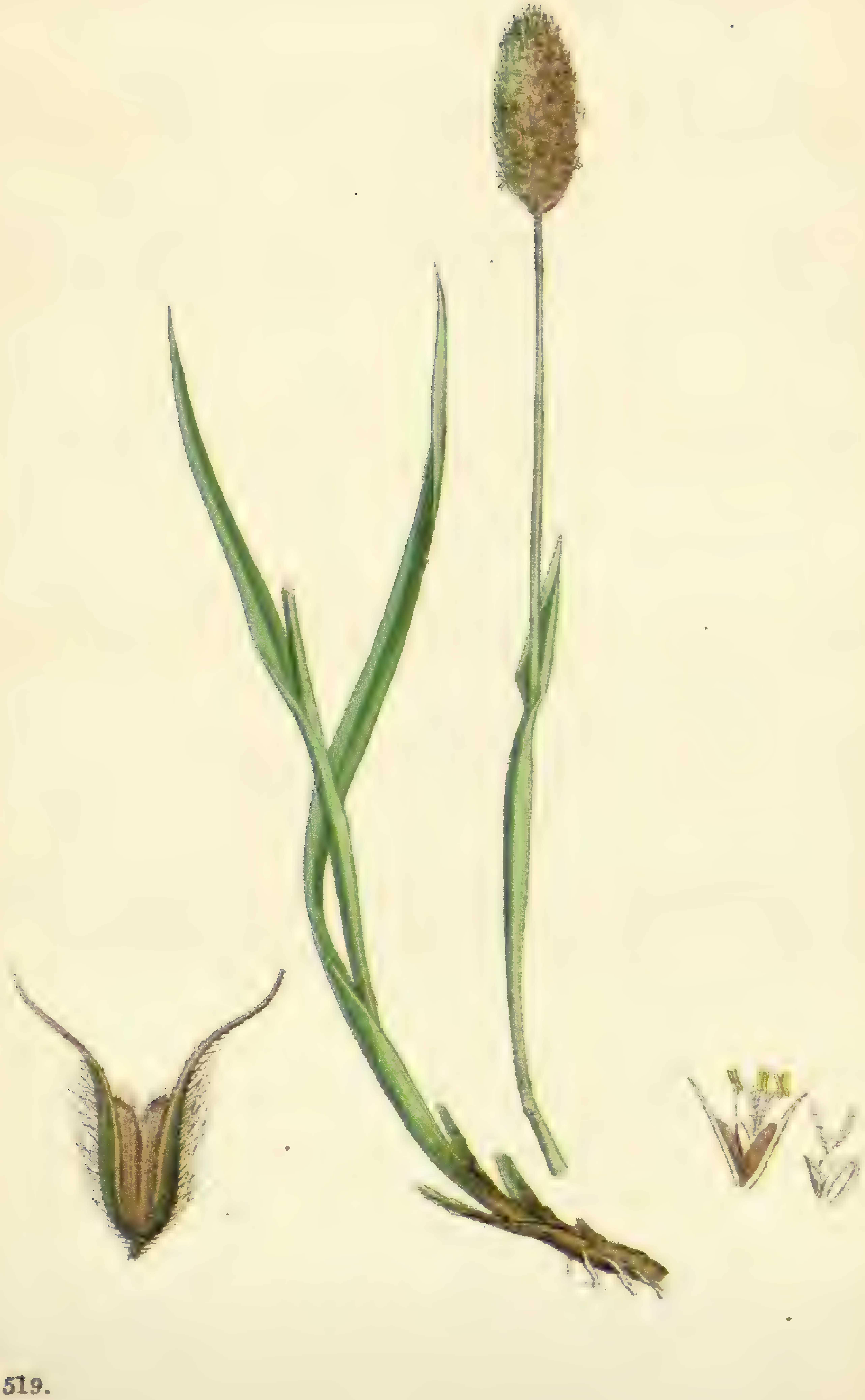
E. B. 759.

Alopecurus pratensis. Meadow Fox-tail-grass.



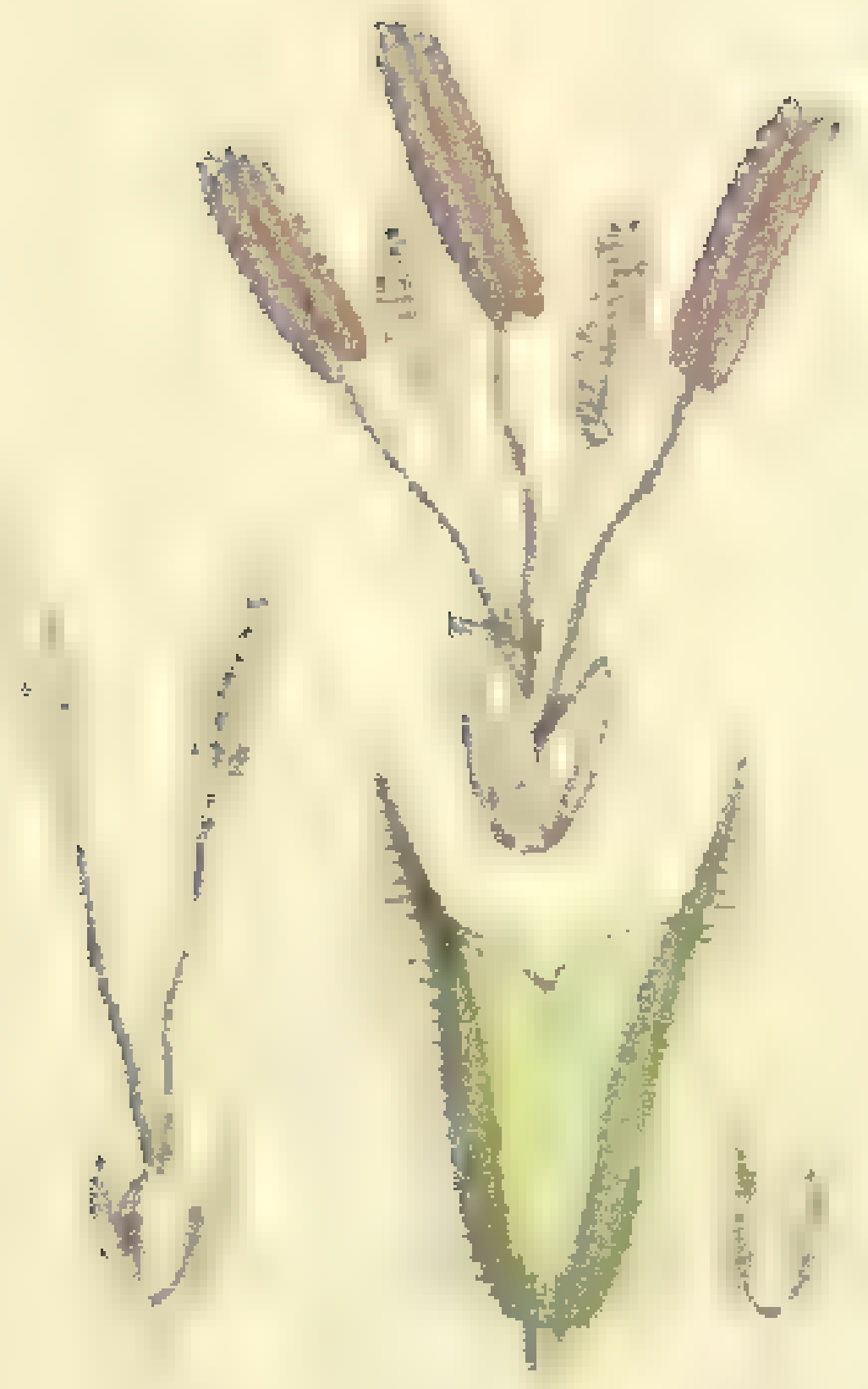
E. B. 1126.

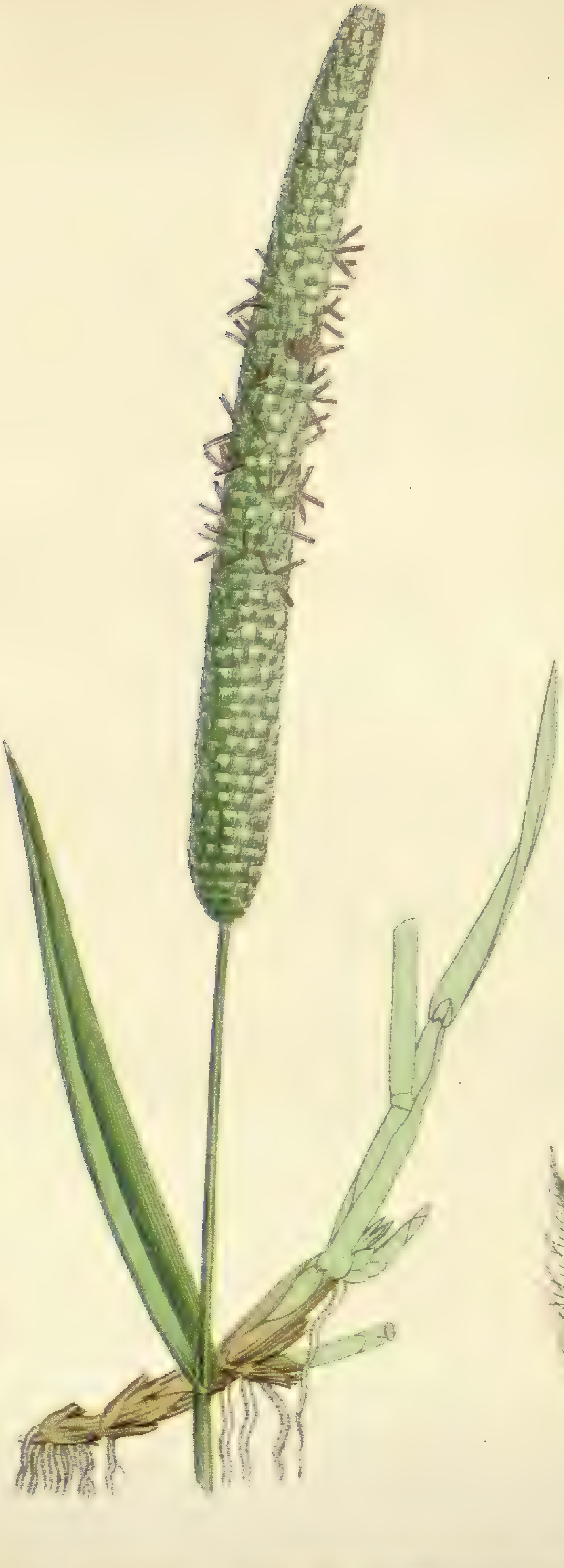
Alopecurus alpinus. **Alpine Fox-tail-grass.**

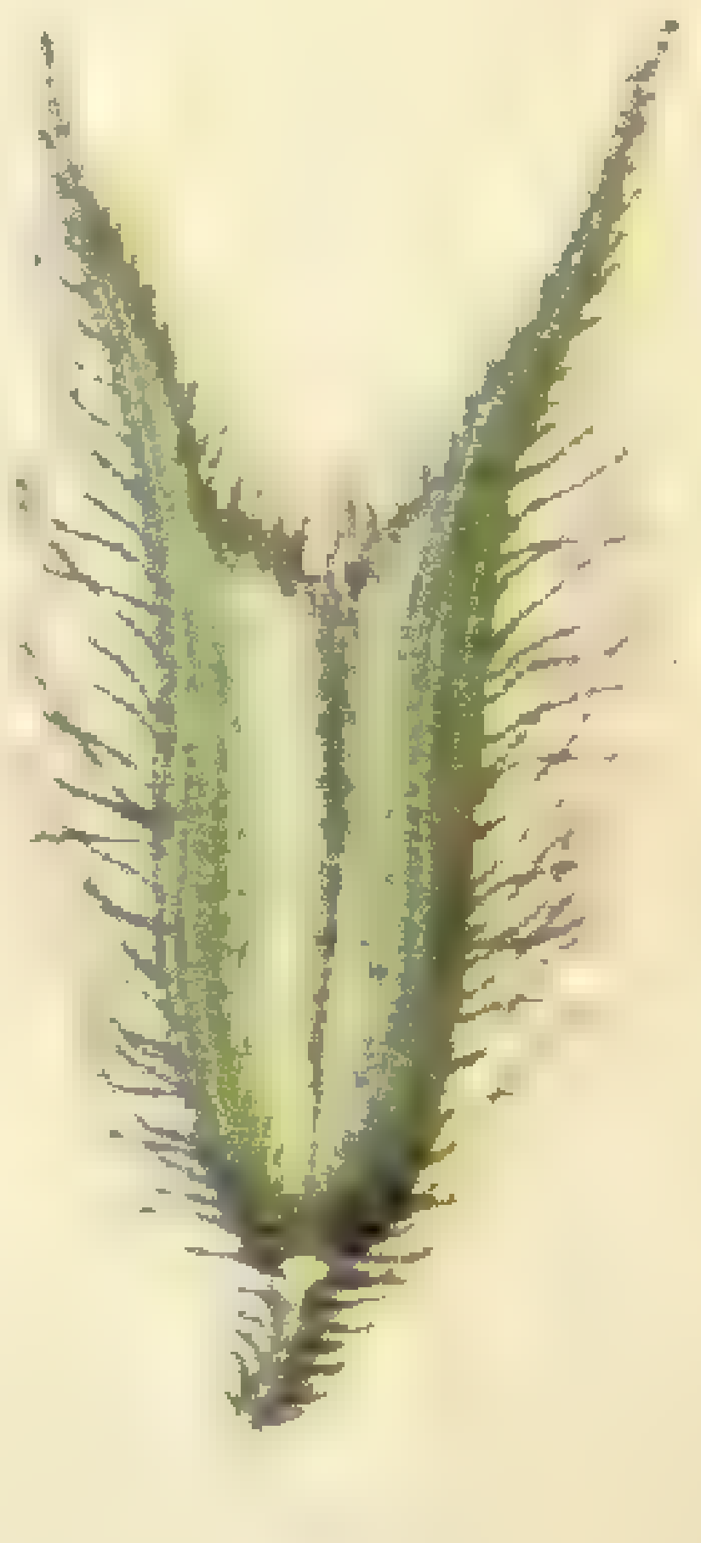


E. B. 519.

Phleum alpinum. Alpine Timothy-grass.

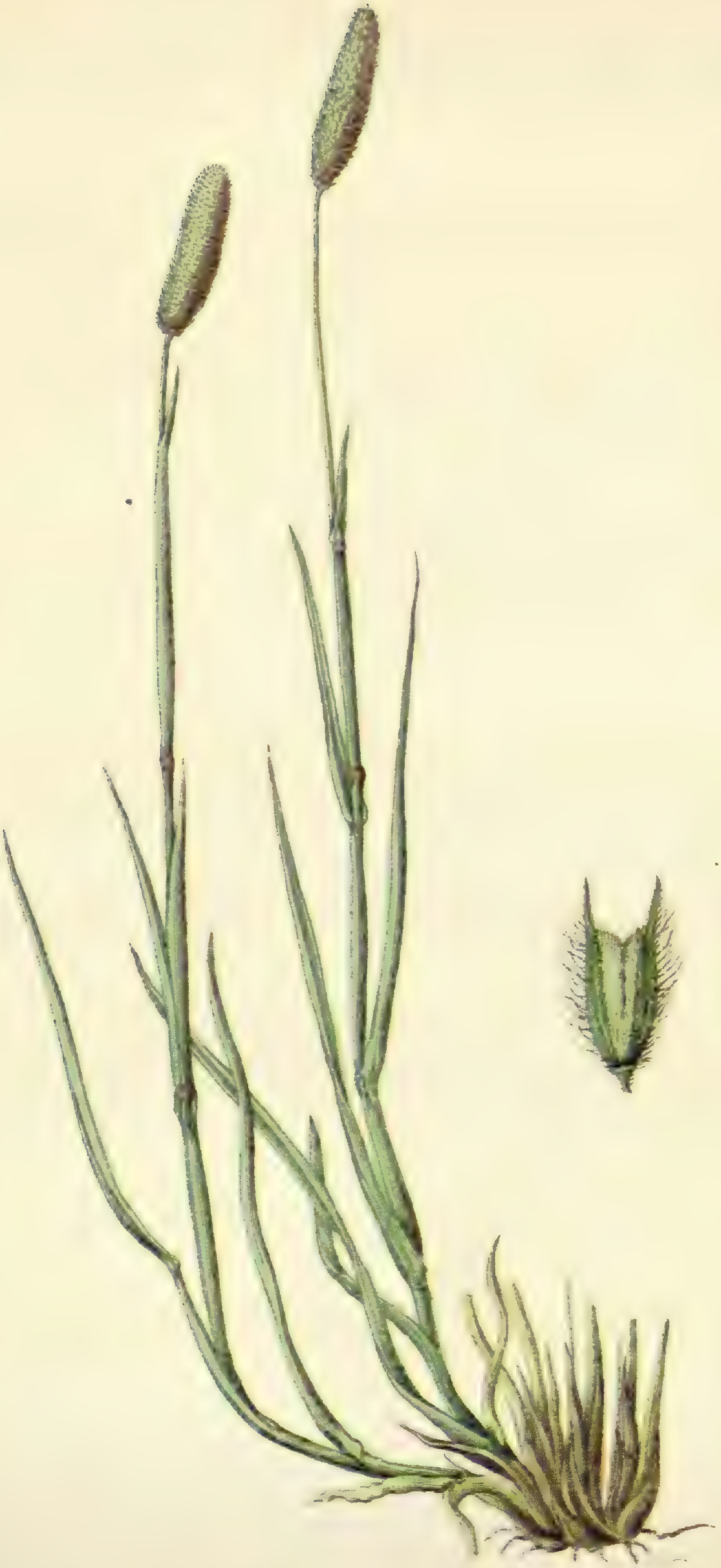




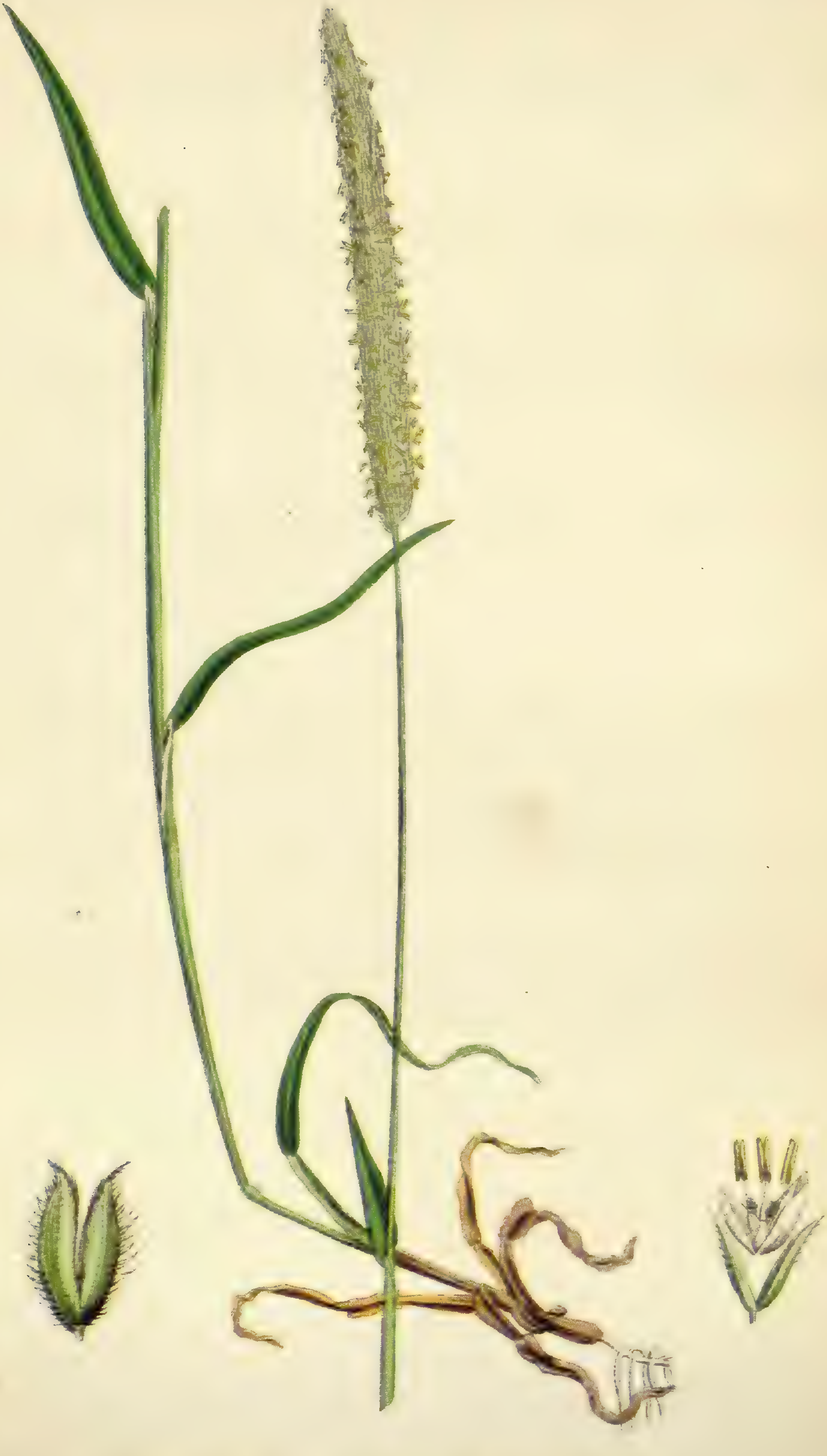


E. B. 1076.

Phleum pratense, var. genuinum. Common Timothy-grass, var. a.

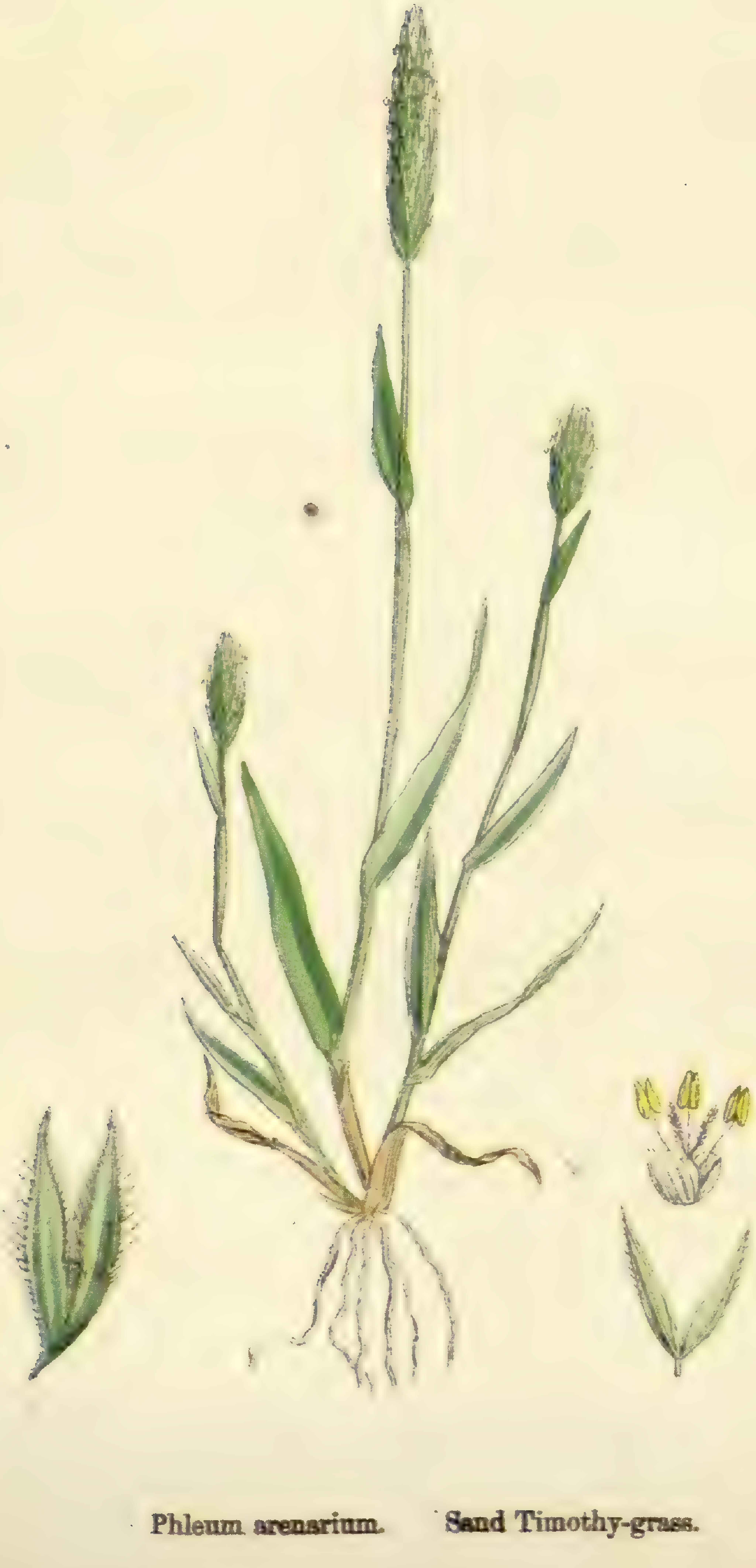


Phleum pratense, var. nodosum. Common Timothy-grass, var. *β*.



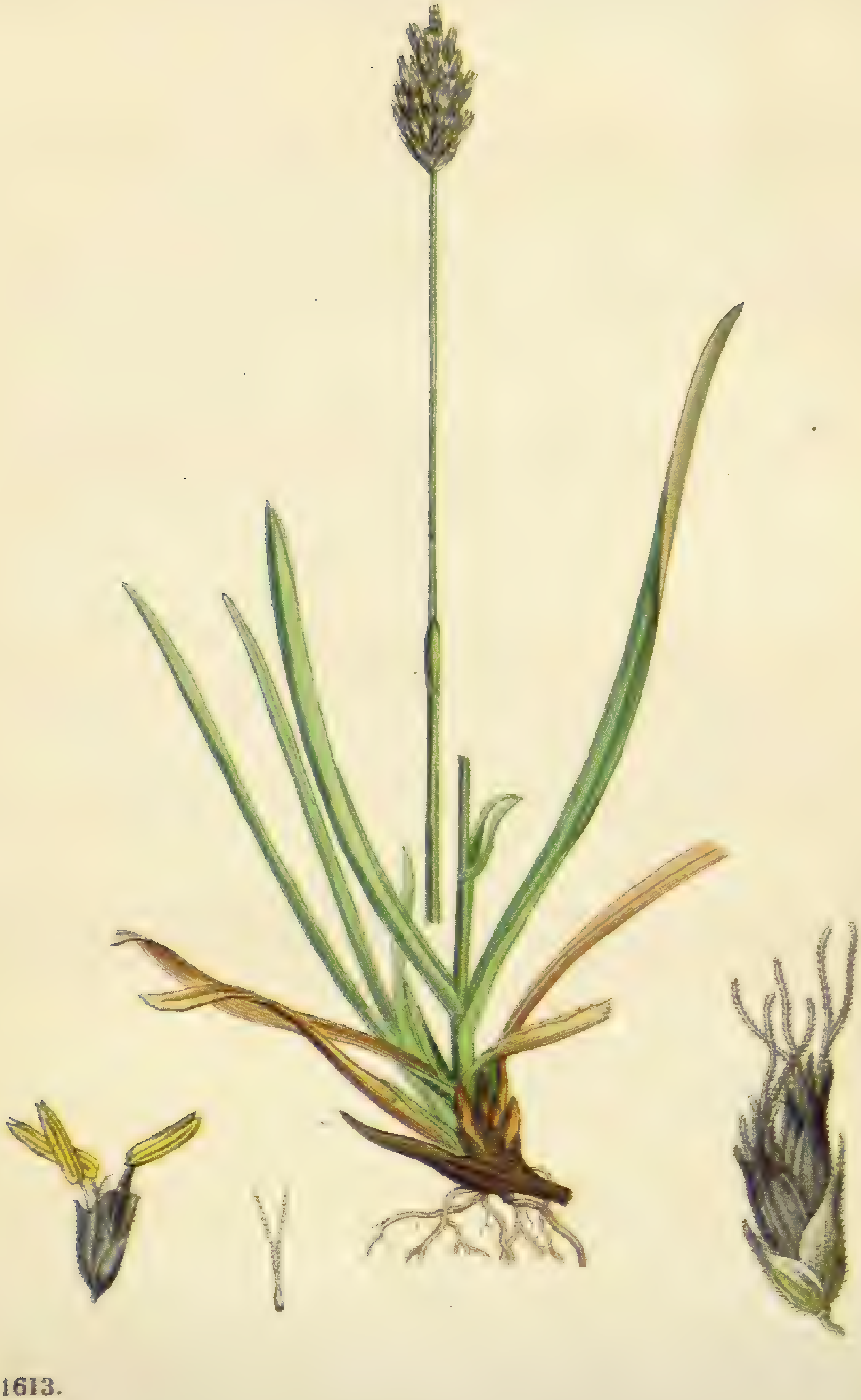
E. B. 459

Phleum Böhmeri. Purple-stalked Timothy-grass.



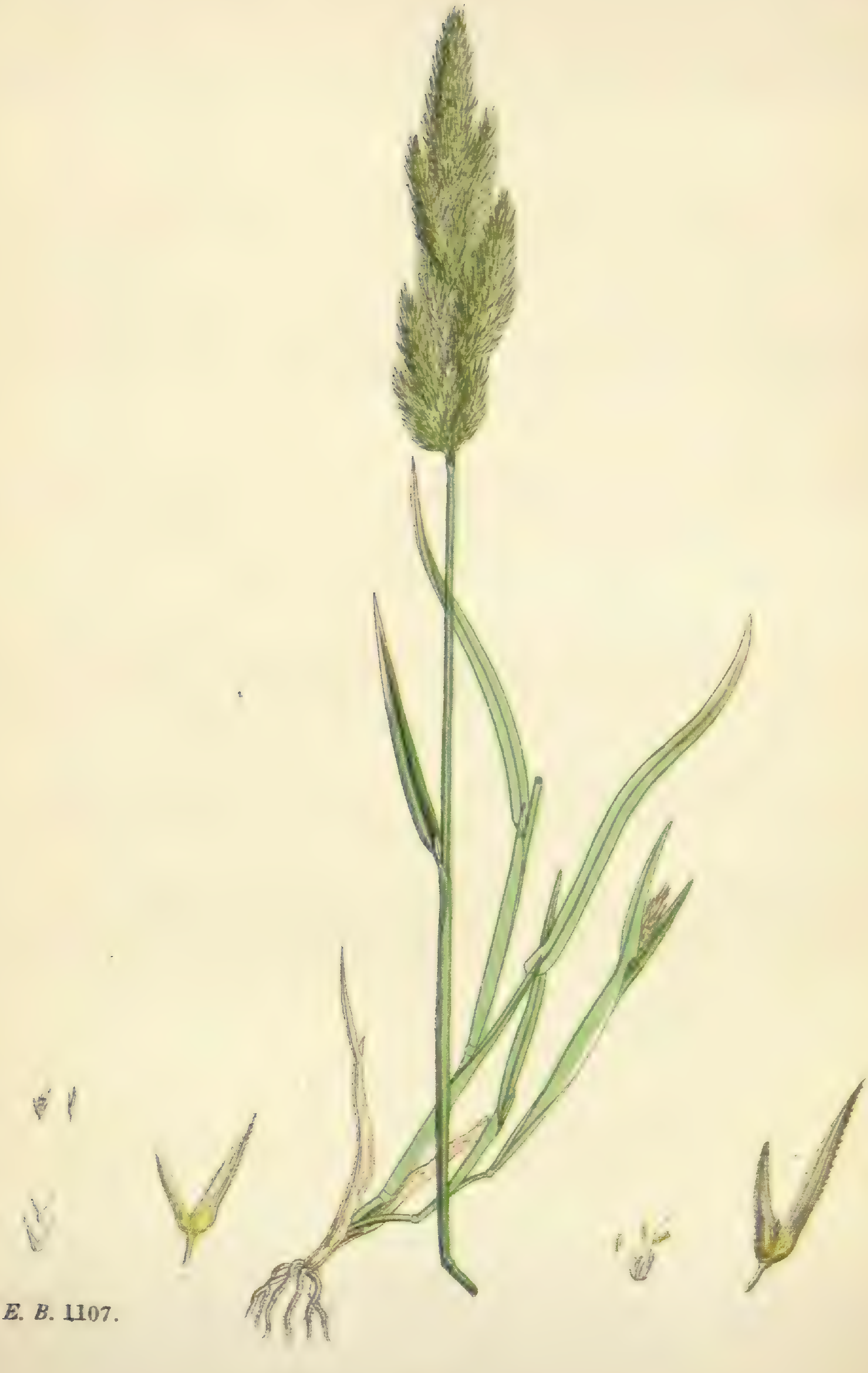
E. B. 222.

Phleum arenarium. Sand Timothy-grass.



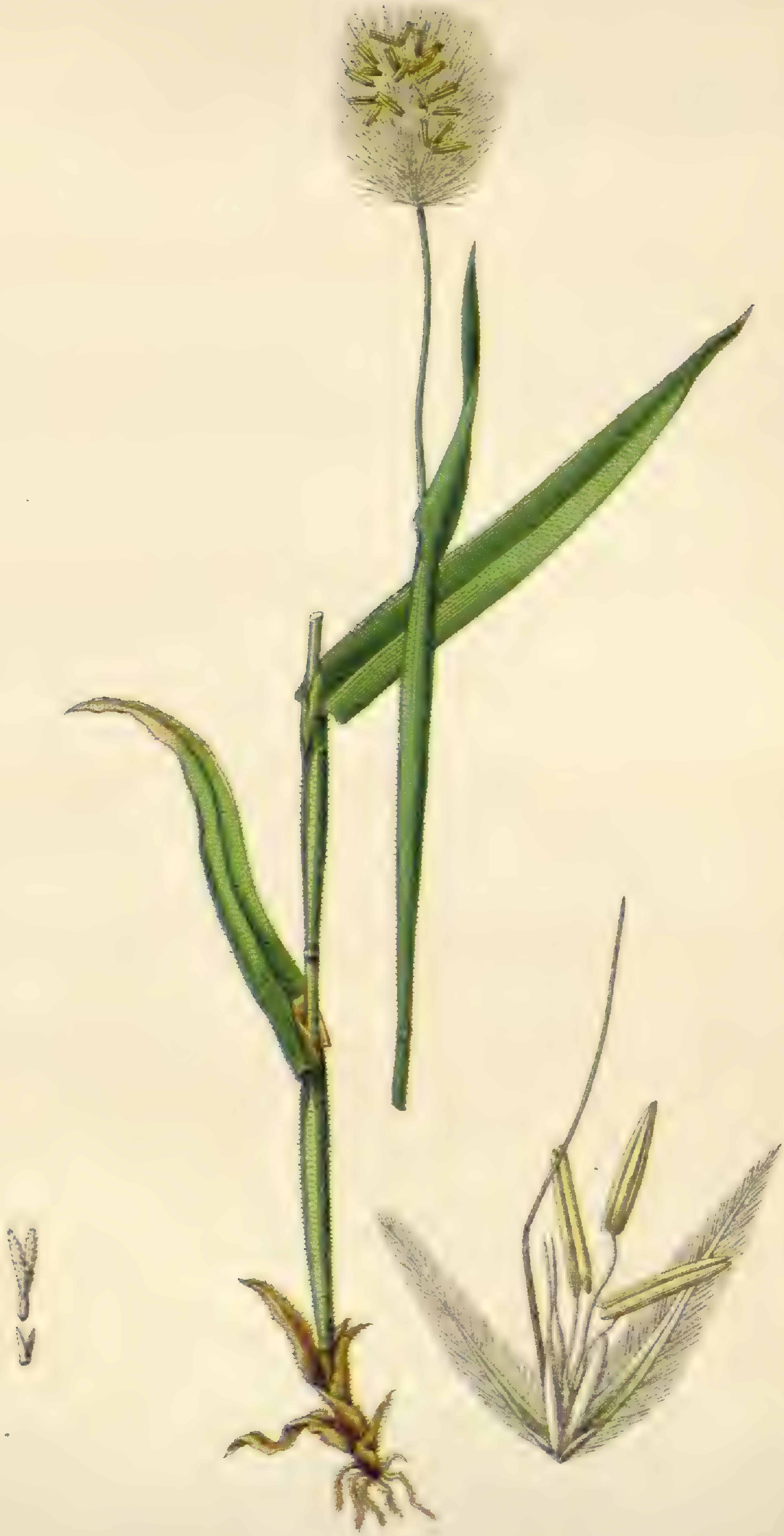
E. B. 1613.

Sesleria cærulea. Blue Moor-grass.



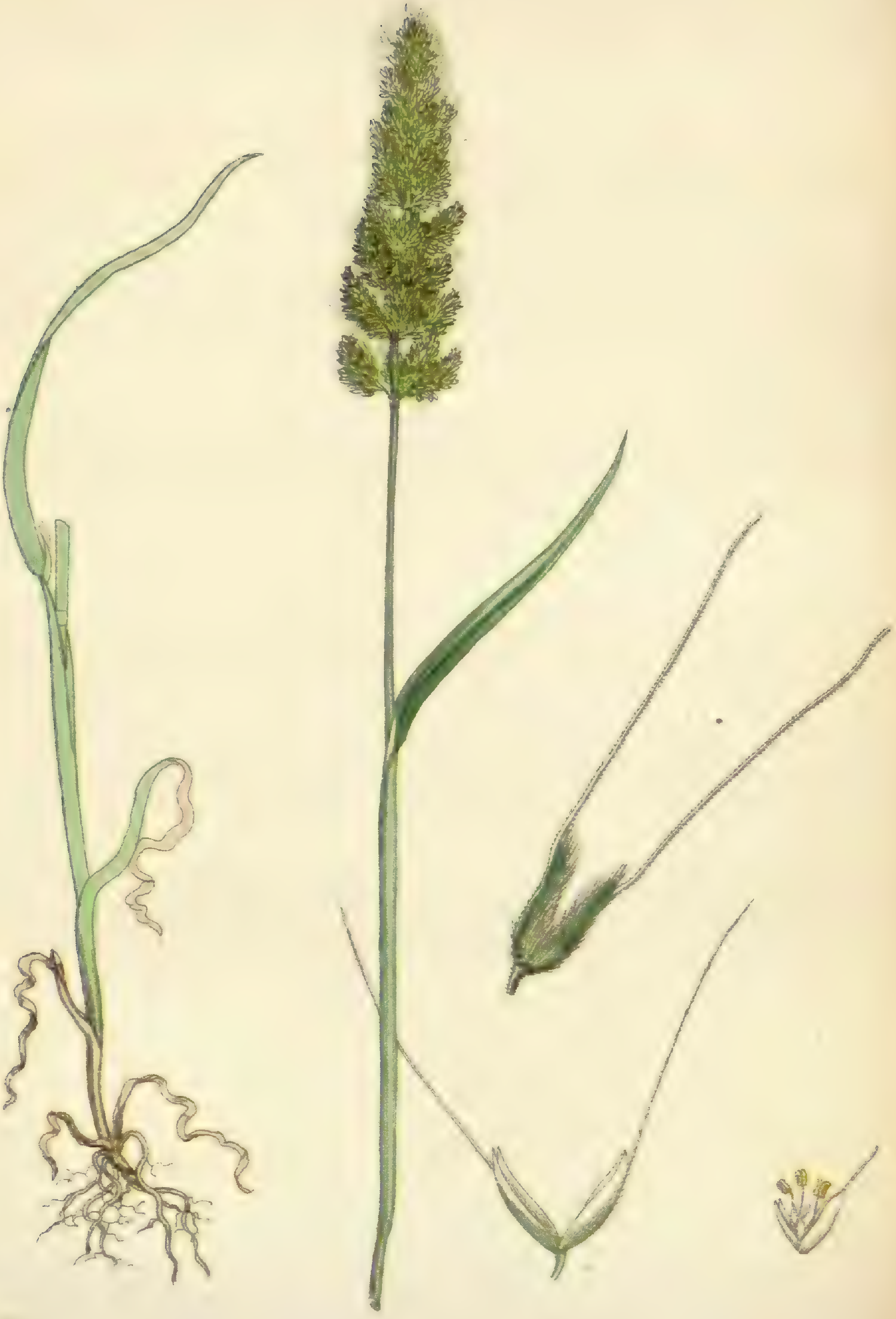
E. B. 1107.

Gastridium lendigerum. Awned Nit-grass.



E. B. 1334.

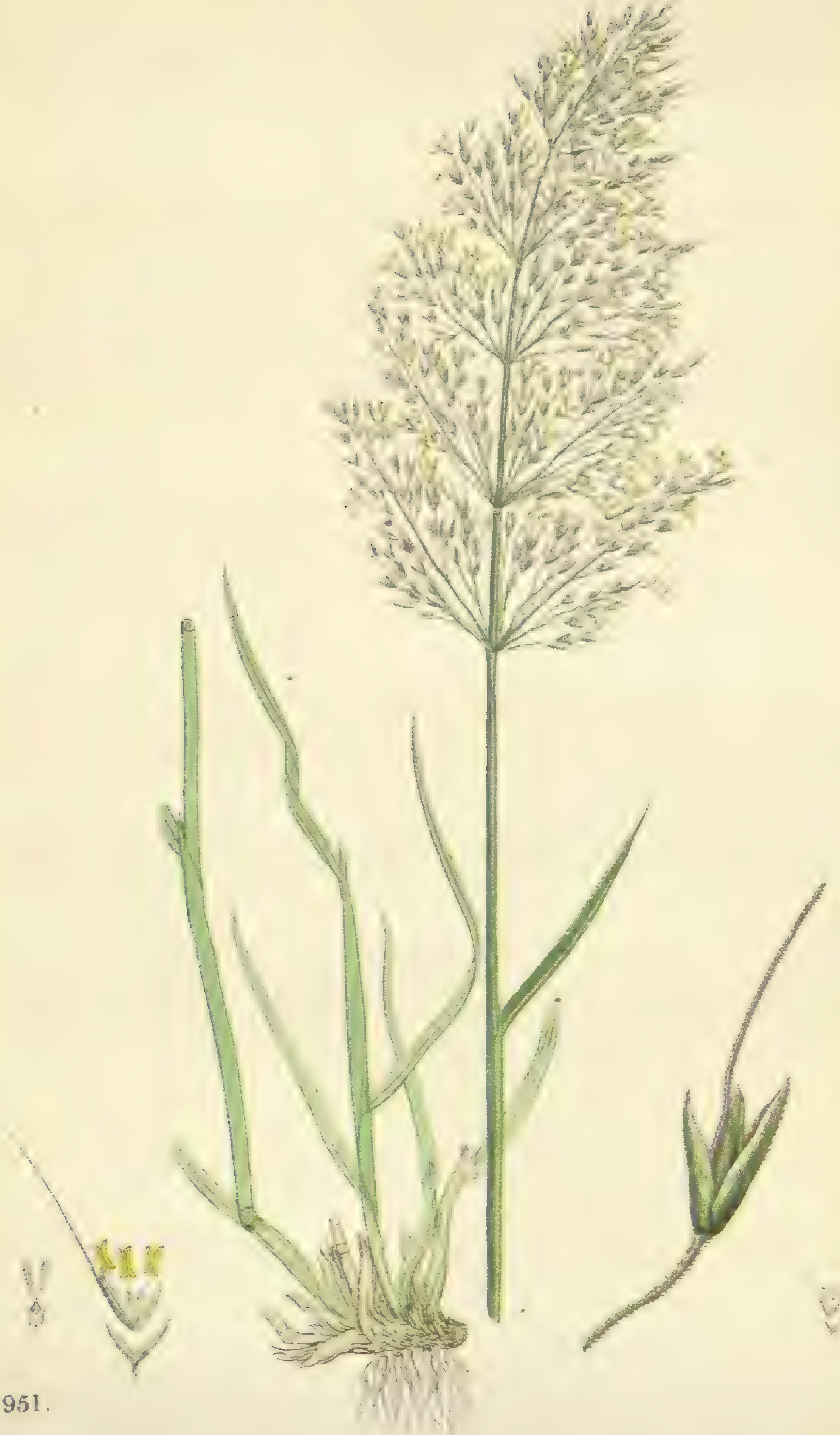
Lagurus ovatus.   Ovate Hare's-tail-grass.



E. B. 1704.

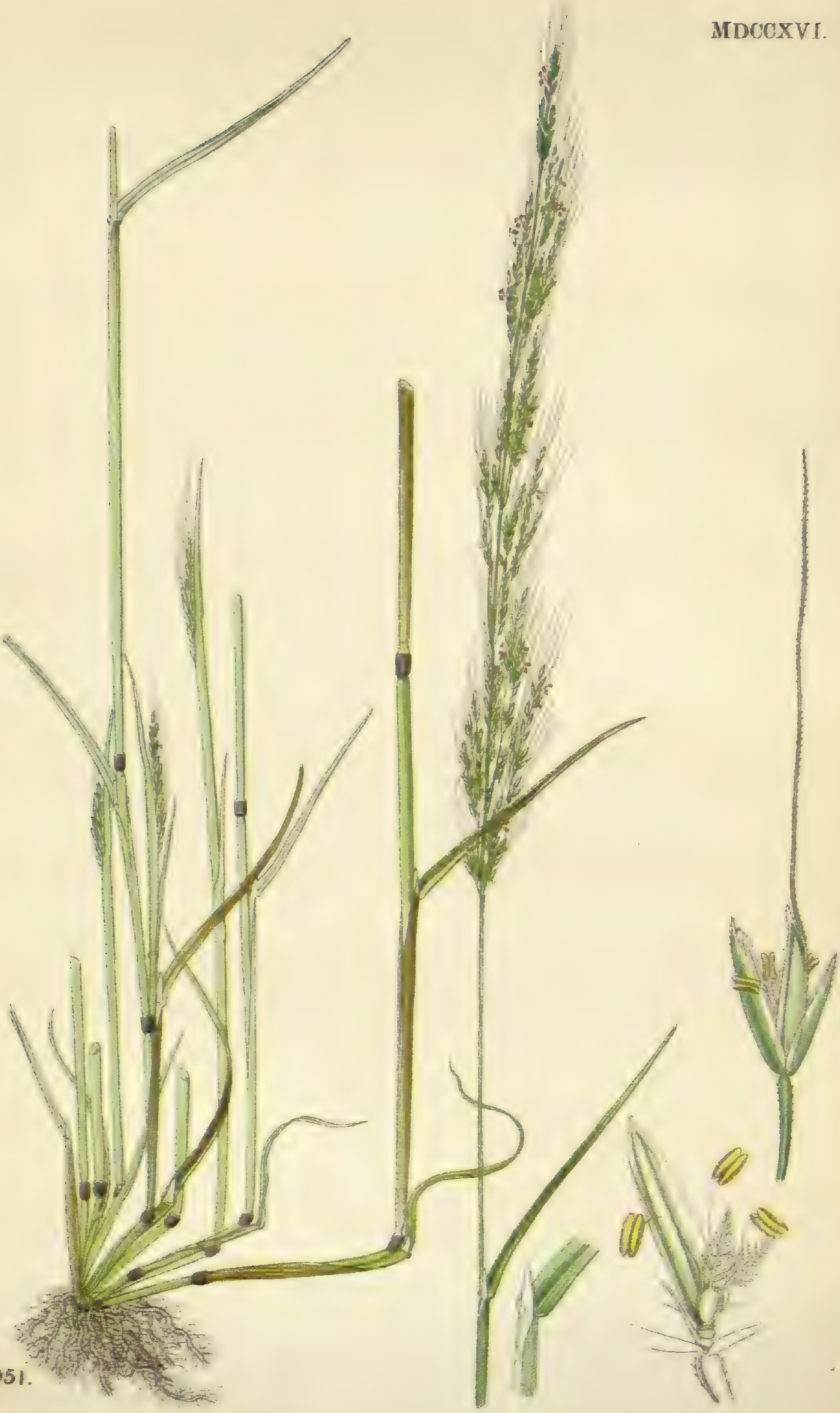
Polypogon Monspeliensis. Annual Beard-grass.

Polypogon littoralis. Perennial Beard-grass.



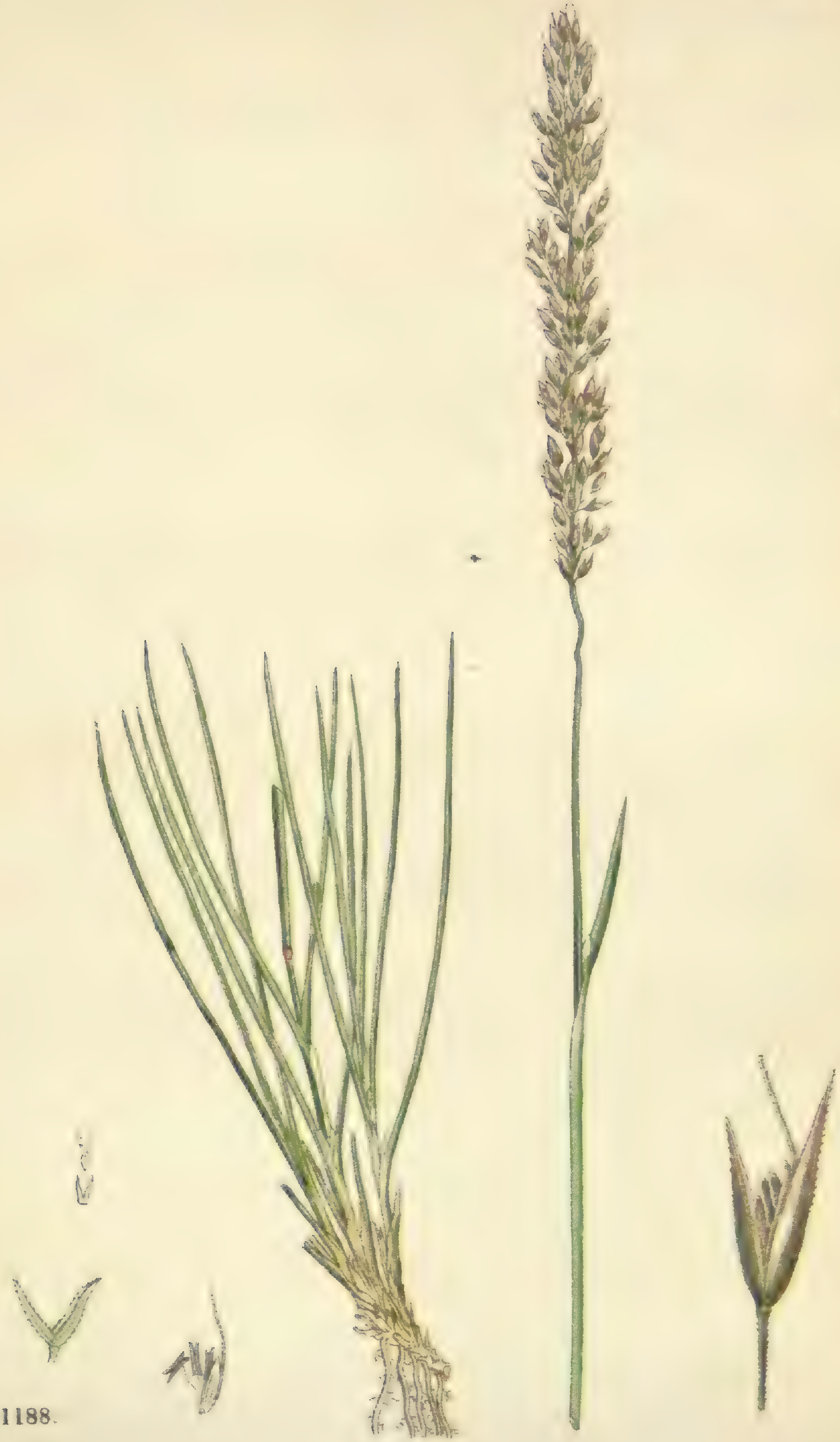
E. B. 951.

Agrostis Spica-venti.   Spreading Silky Bent-grass



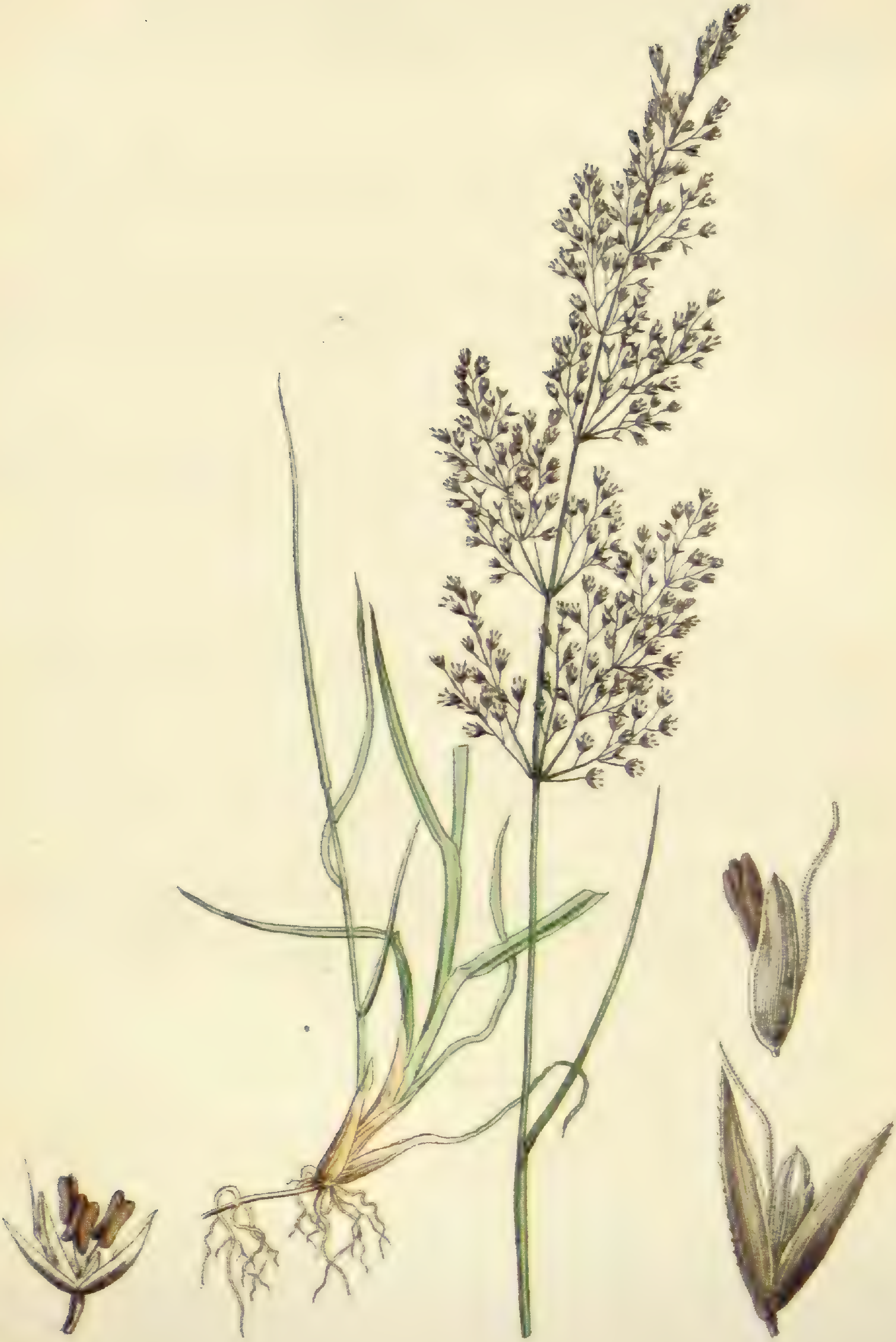
E. B. S. 2951.

Agrostis interrupta. Dense-flowered Silky Bent-grass.



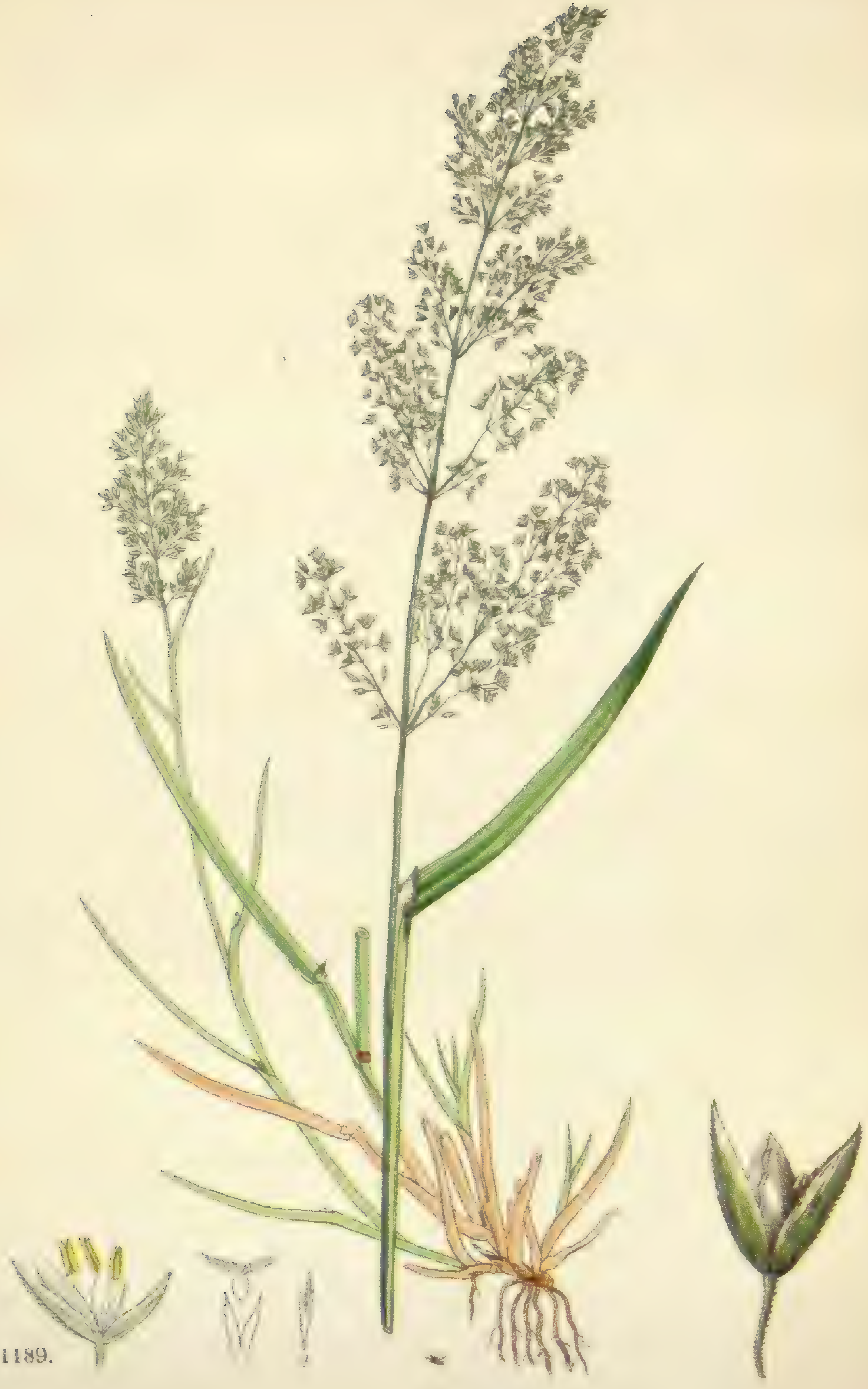
E. B. 1188.

Agrostis setacea. Bristle-leaved Bent-grass.



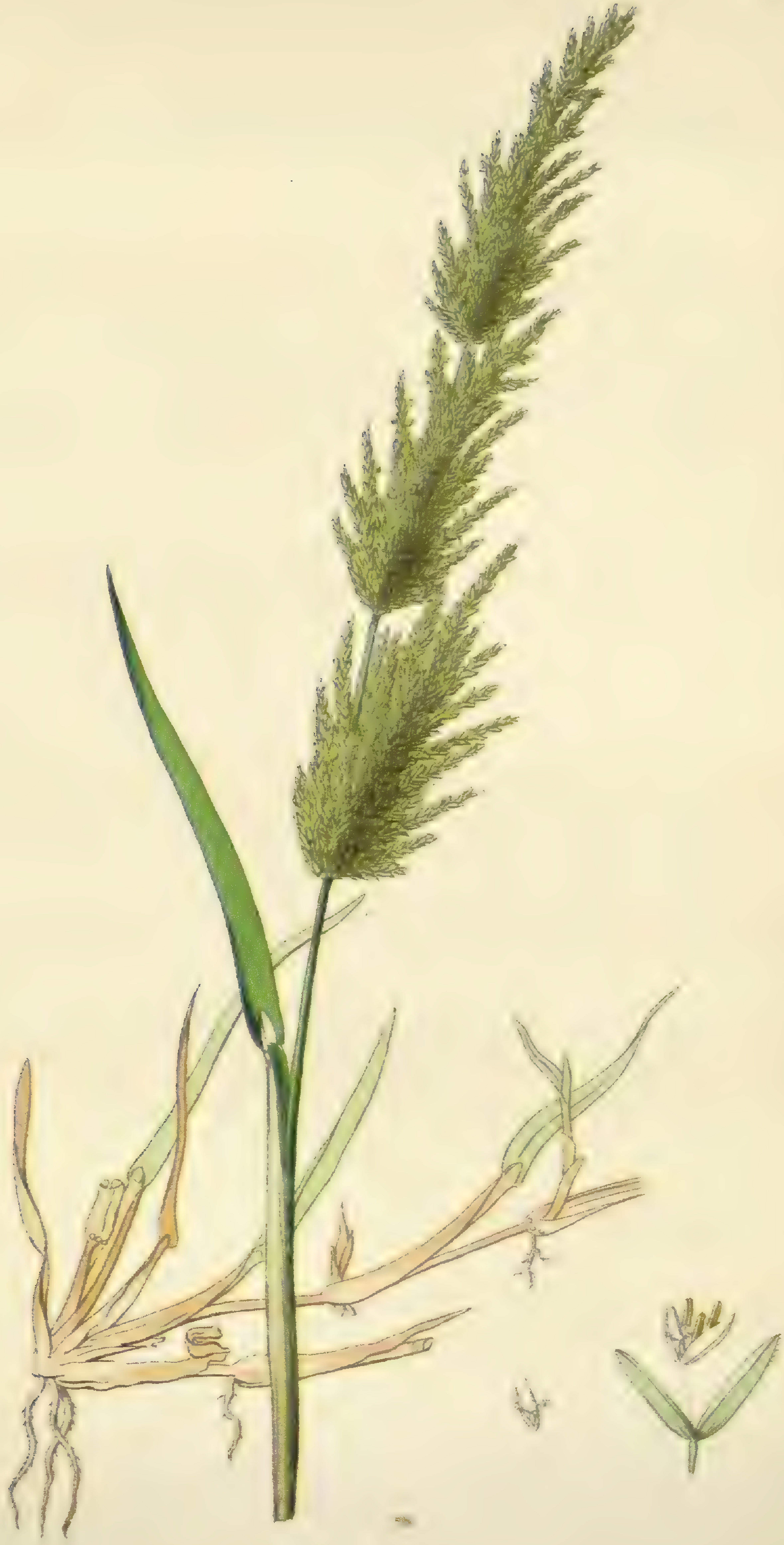
E. B. 1856.

Agrostis canina. Brown Bent-grass.



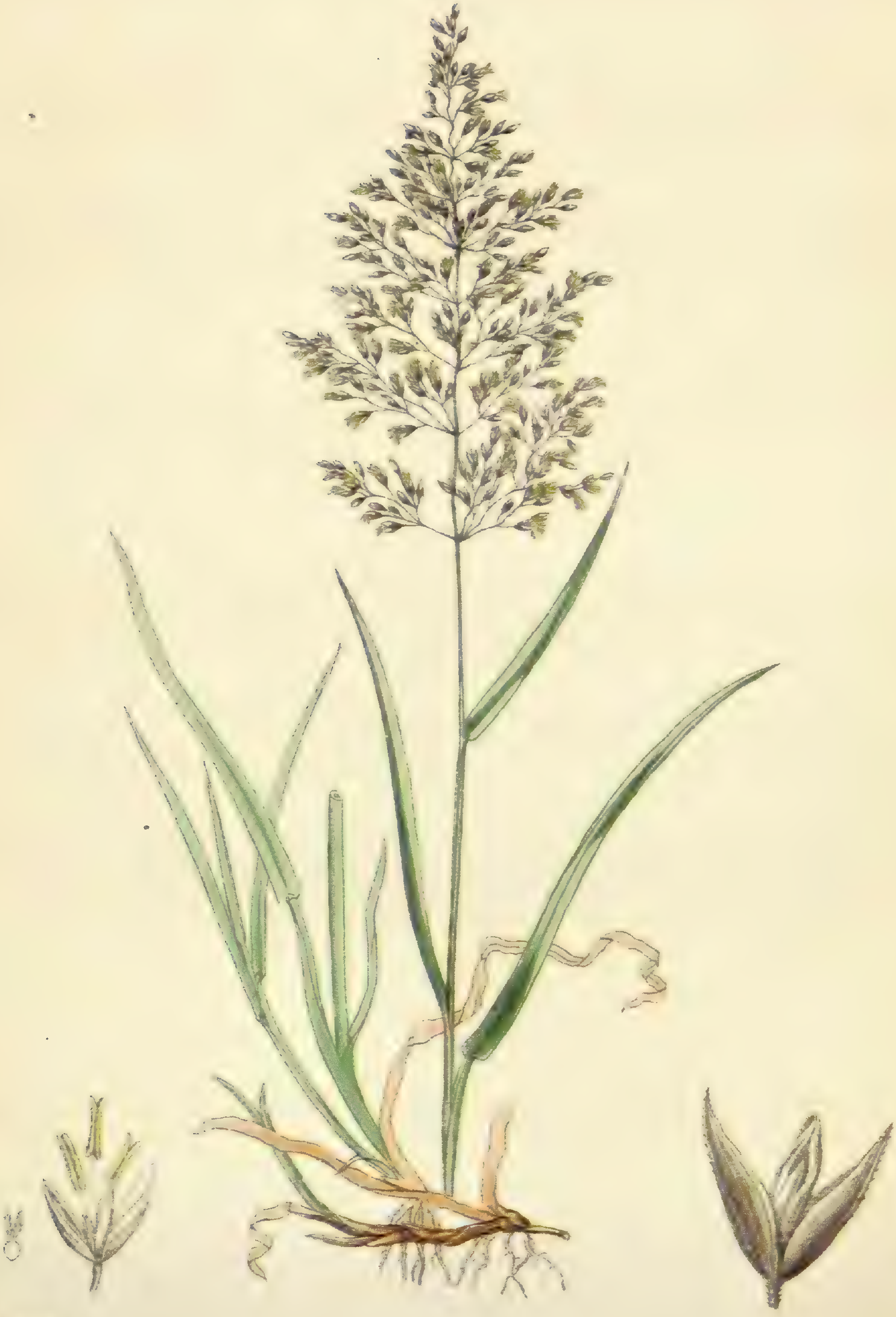
E. B. 1189.

Agrostis alba, var. genuina. Marsh Bent-grass, var. *a*.



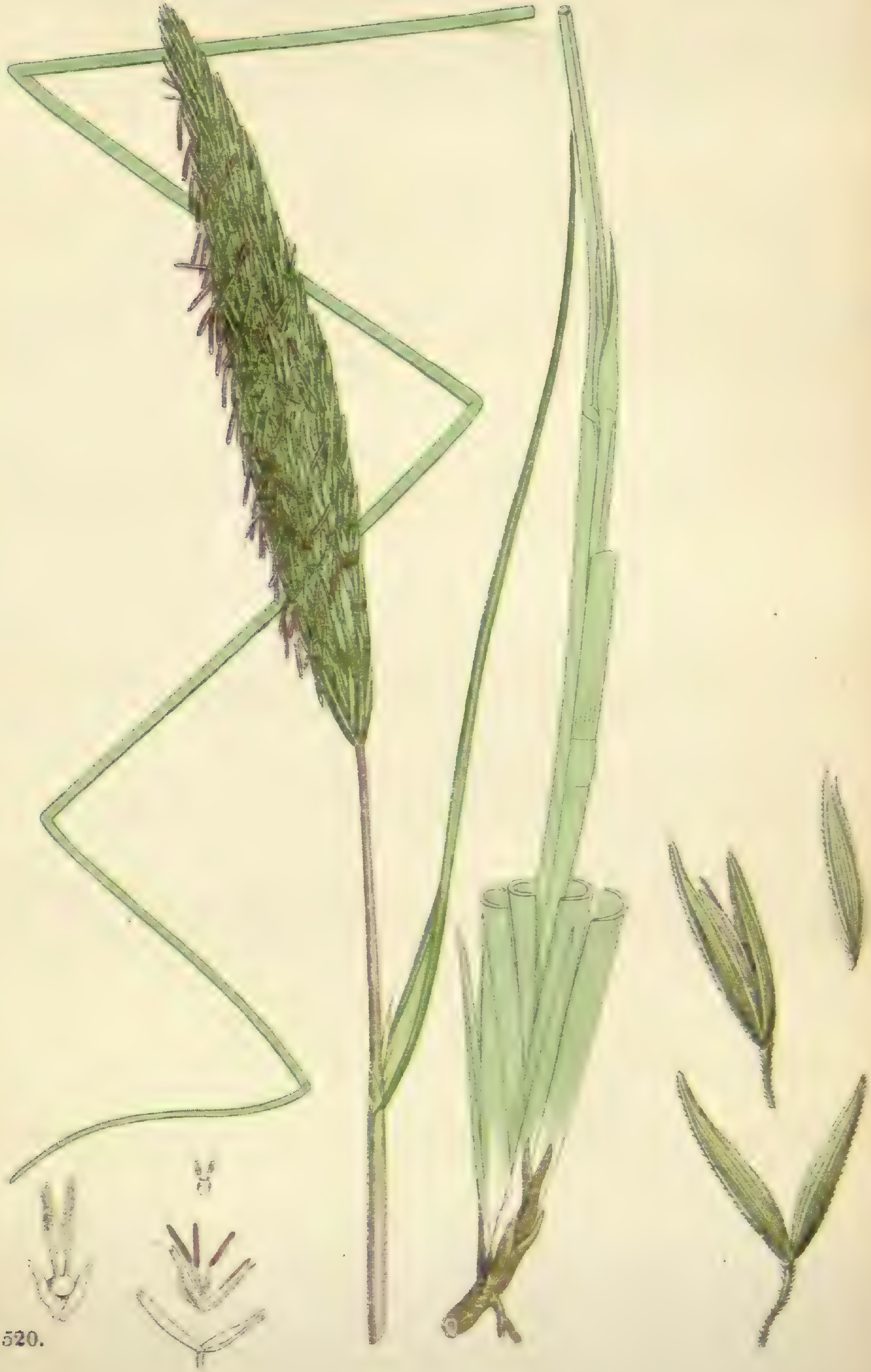
E. B 1532.

Agrostis alba, var. stolonifera. Marsh Bent-grass, var. β.



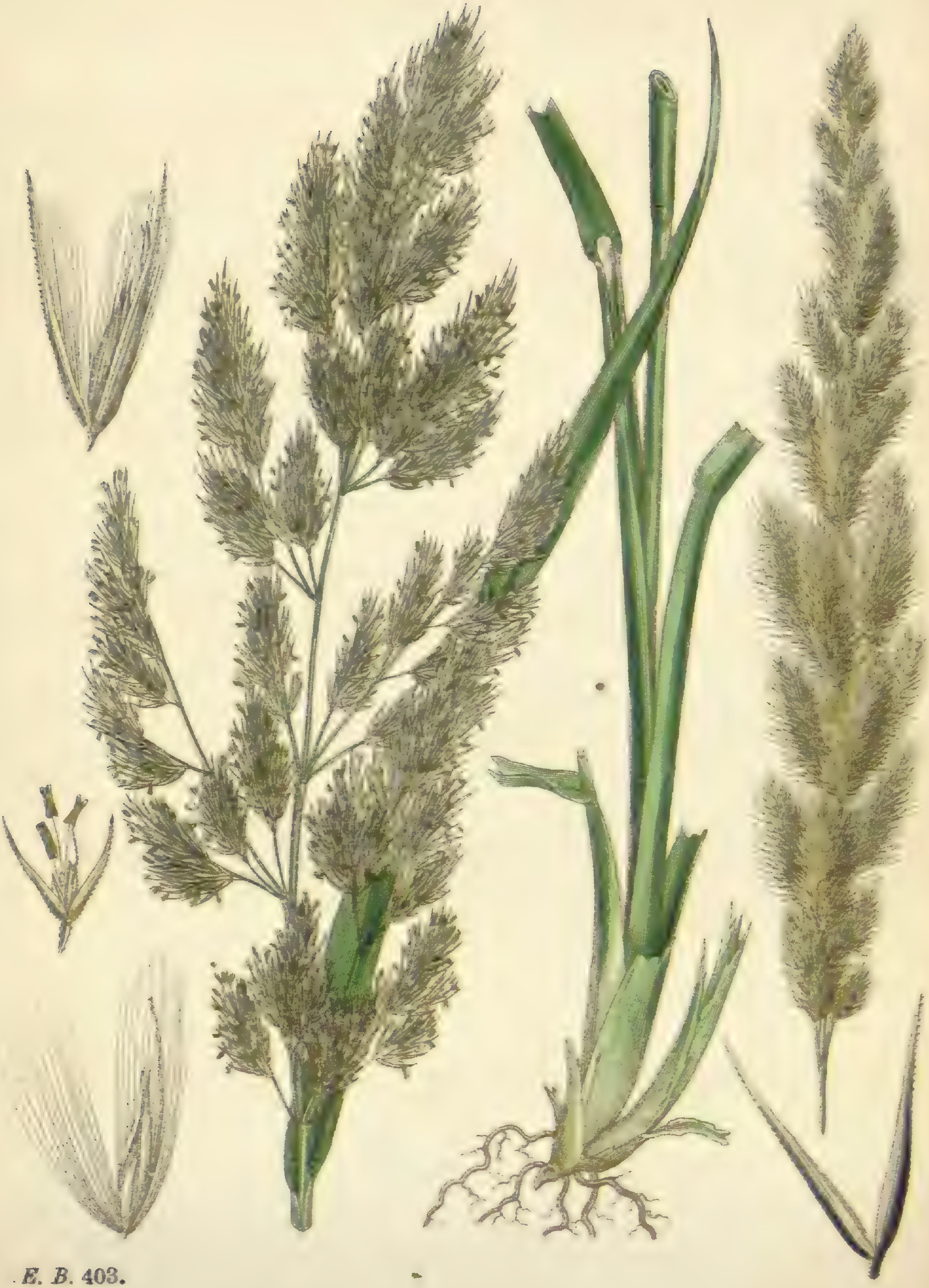
E. B. 1671.

Agrostis vulgaris. Common Bent-grass.



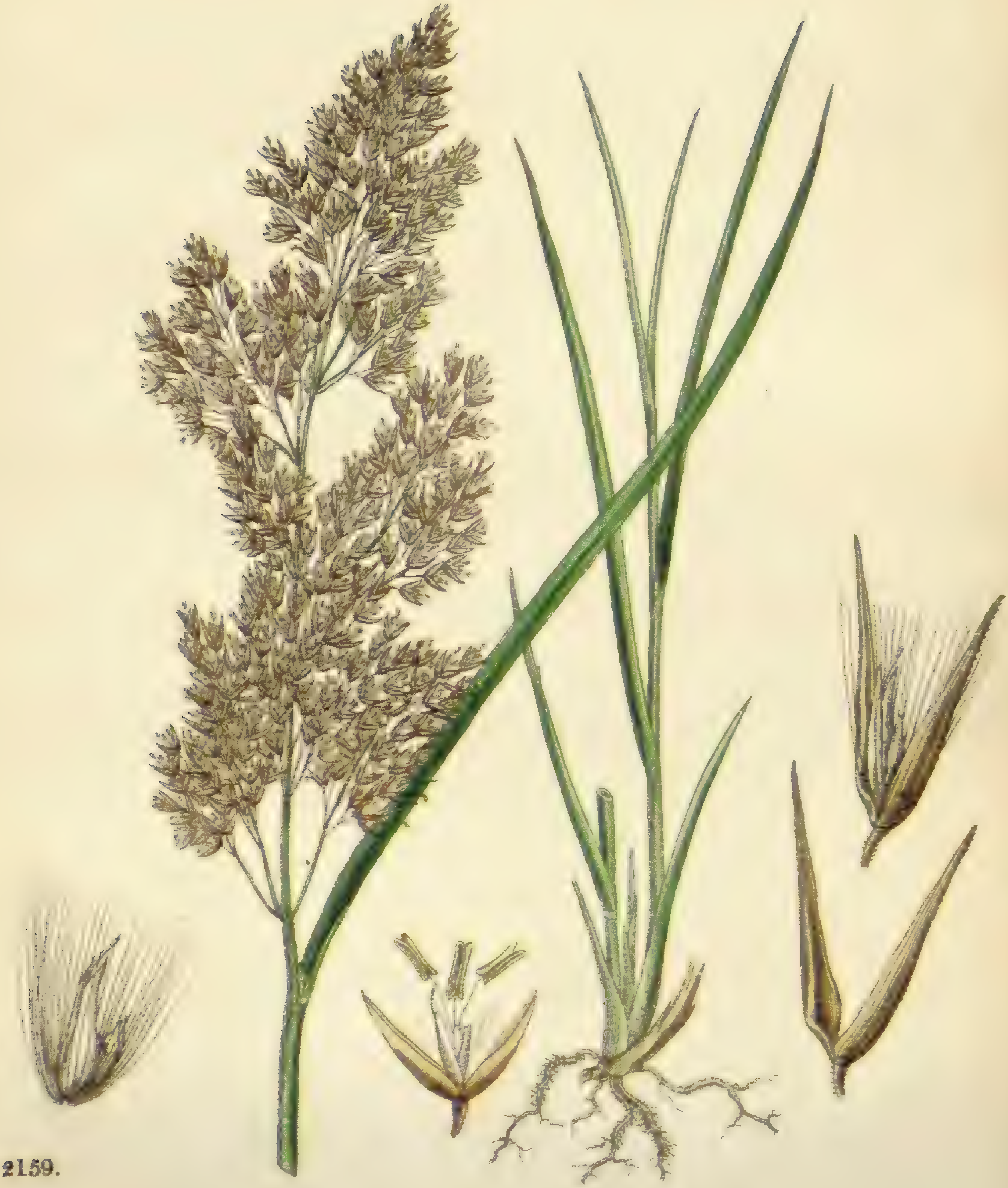
E. B. 520.

Psamma arenaria. Marram.



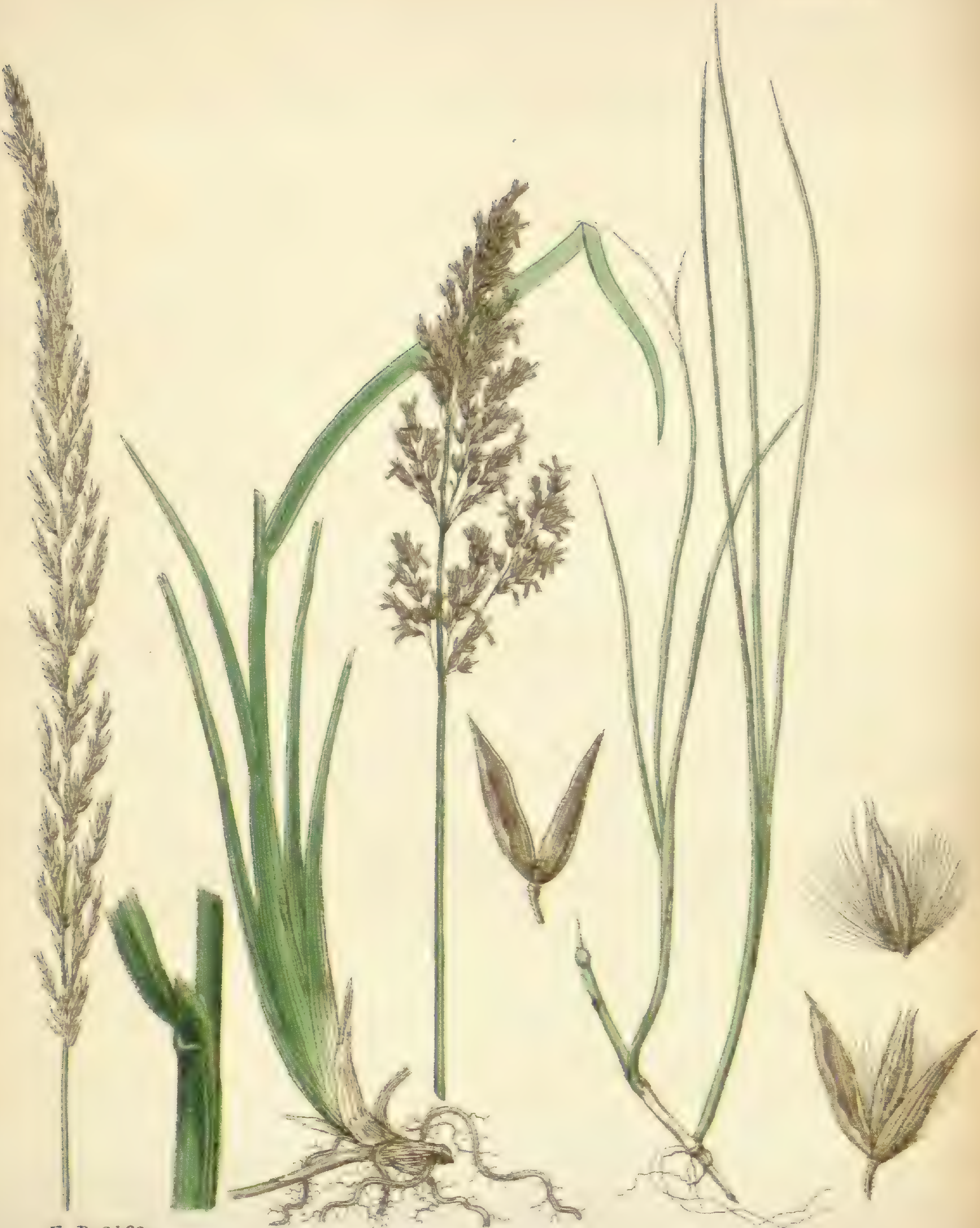
E. B. 403.

Calamagrostis Epigejos. Wood Small-reed.



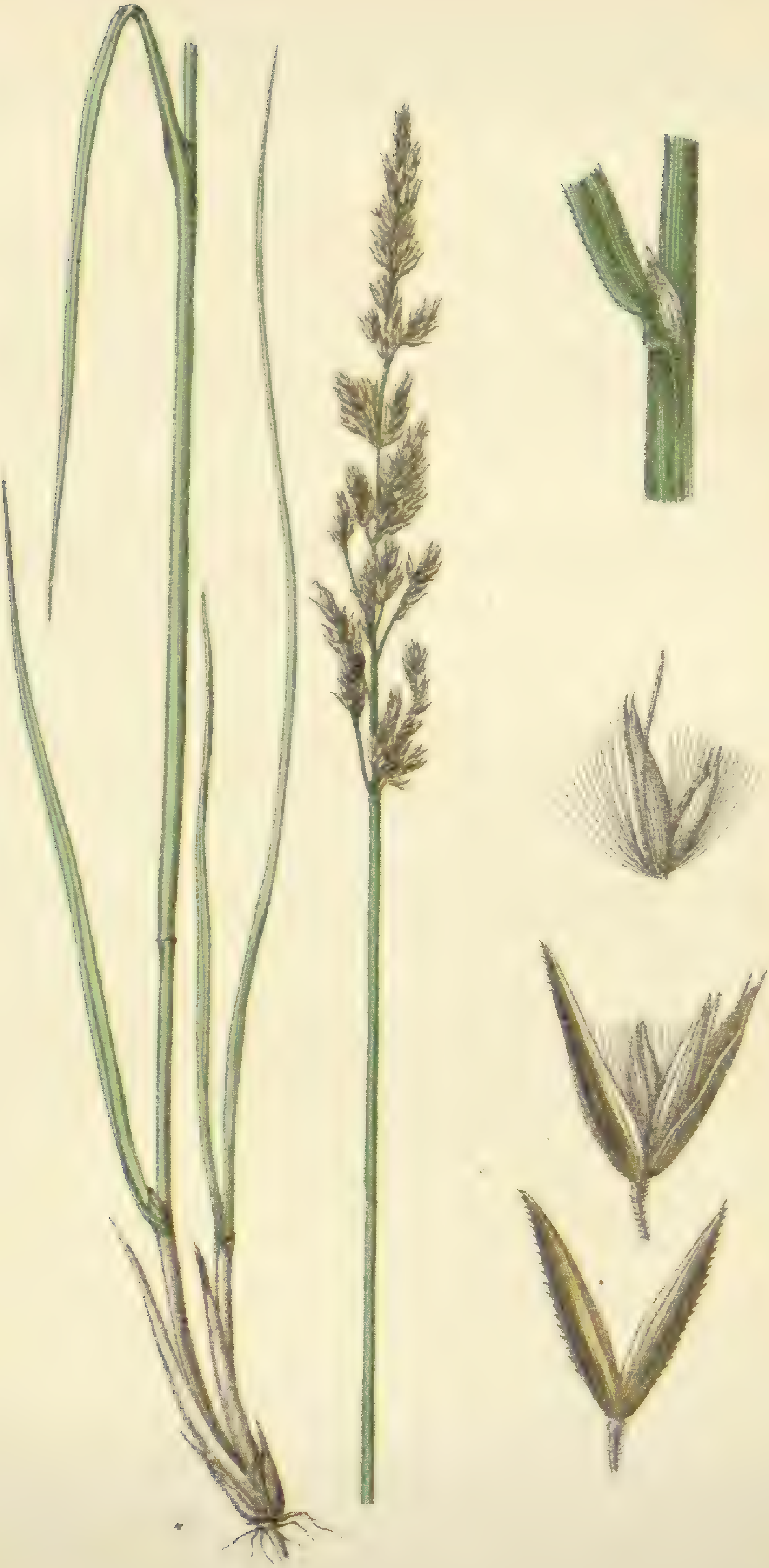
E. B. 2159.

Calamagrostis lanceolata. Purple-flowered Small-reed



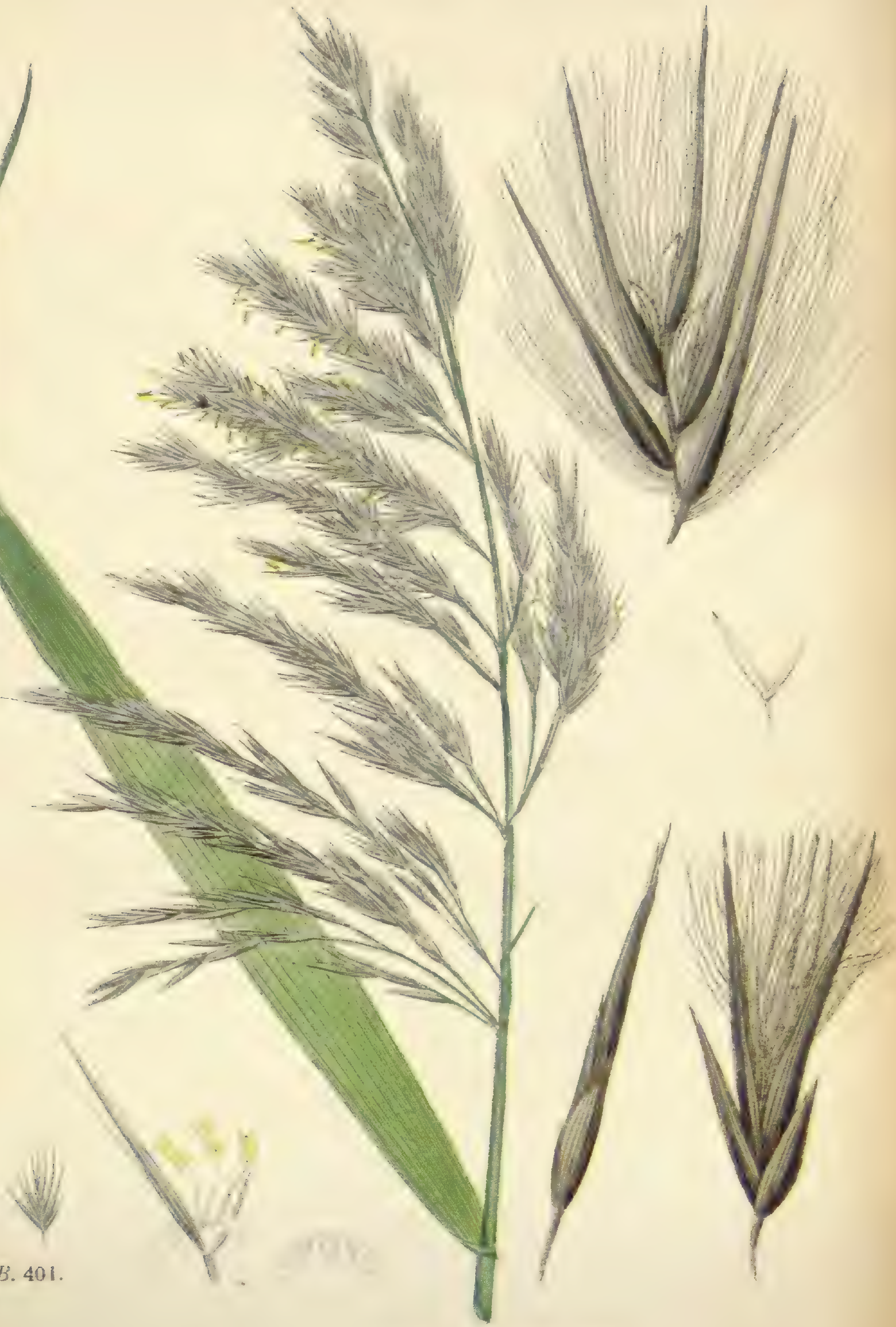
E. B. 2160.

Calamagrostis stricta. Narrow Small-reed, var. *α*.



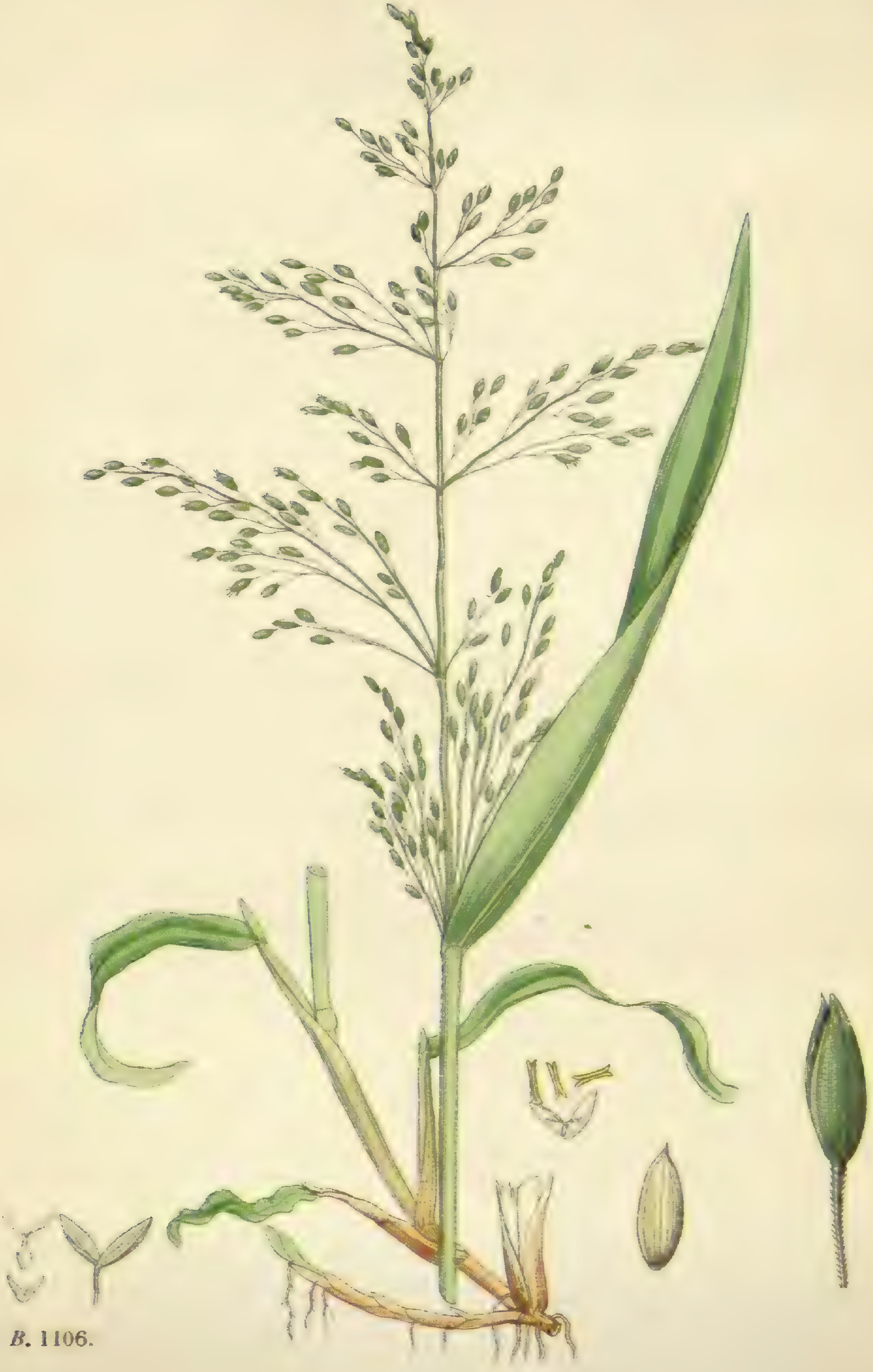
Calamagrostis stricta, var. Hookeri. Narrow Small-reed, var. β

MDCCXXVII.



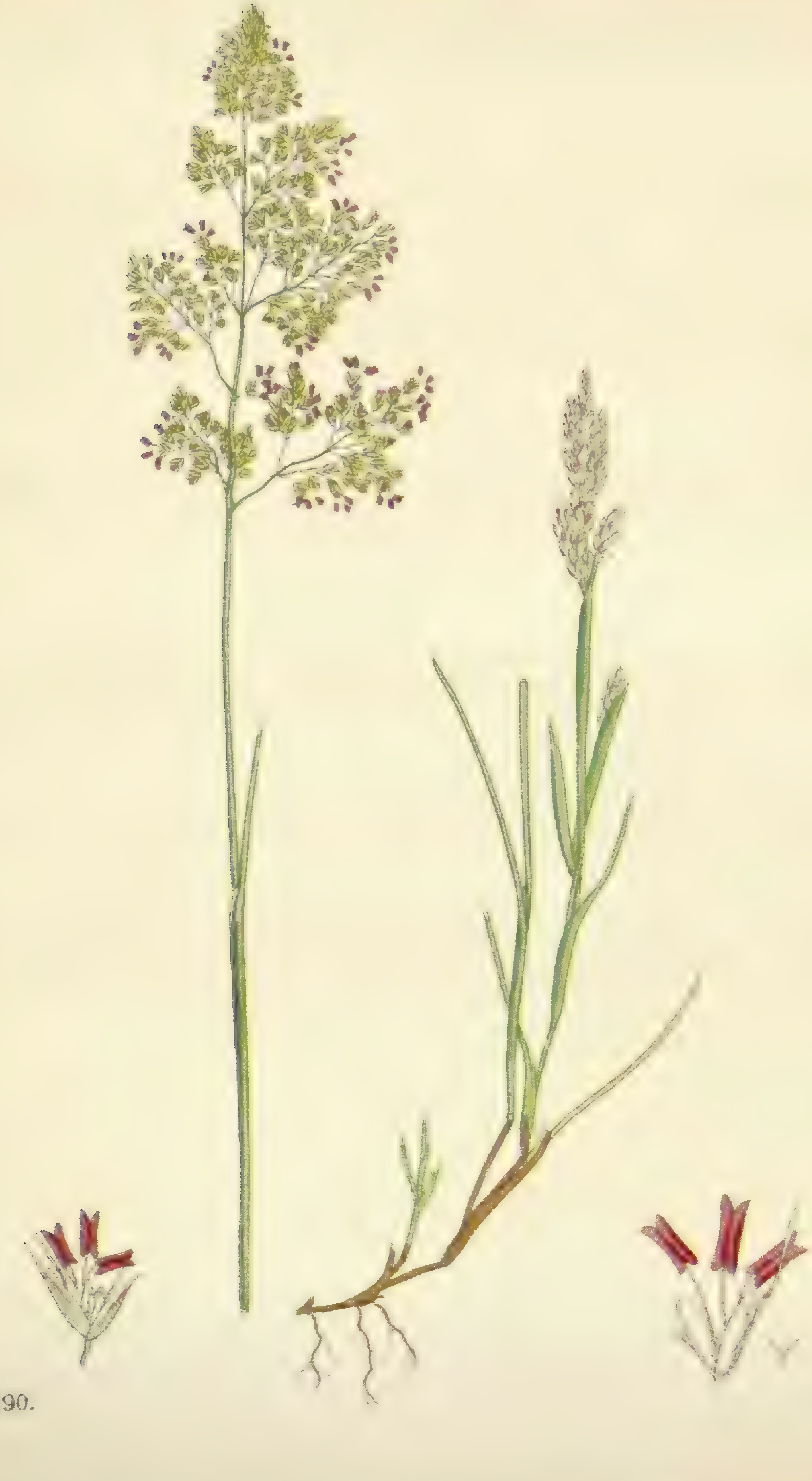
E. B. 401.

Phragmites communis. Common Reed.



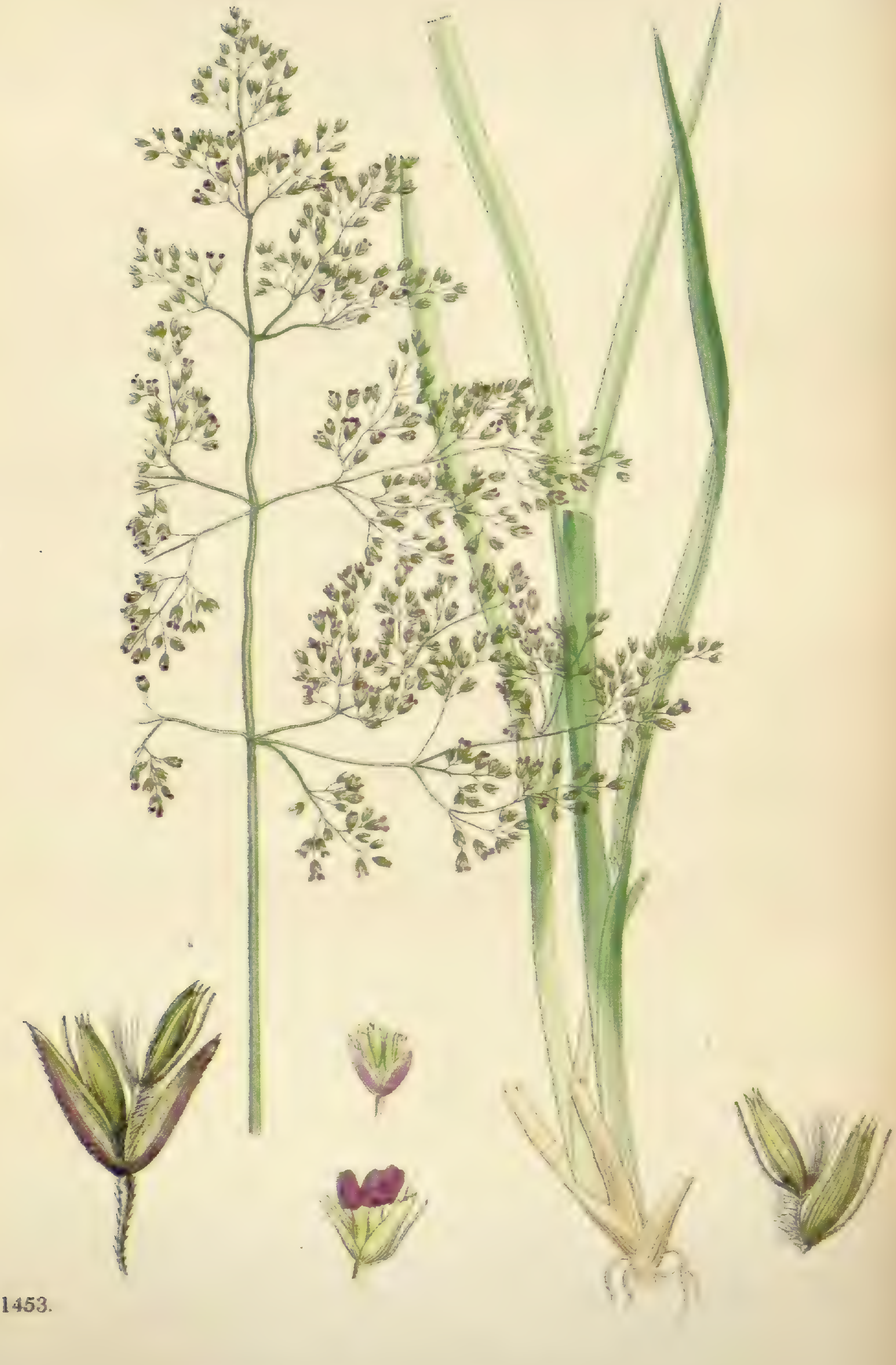
E. B. 1106.

Milium effusum. Wood Millet-grass.



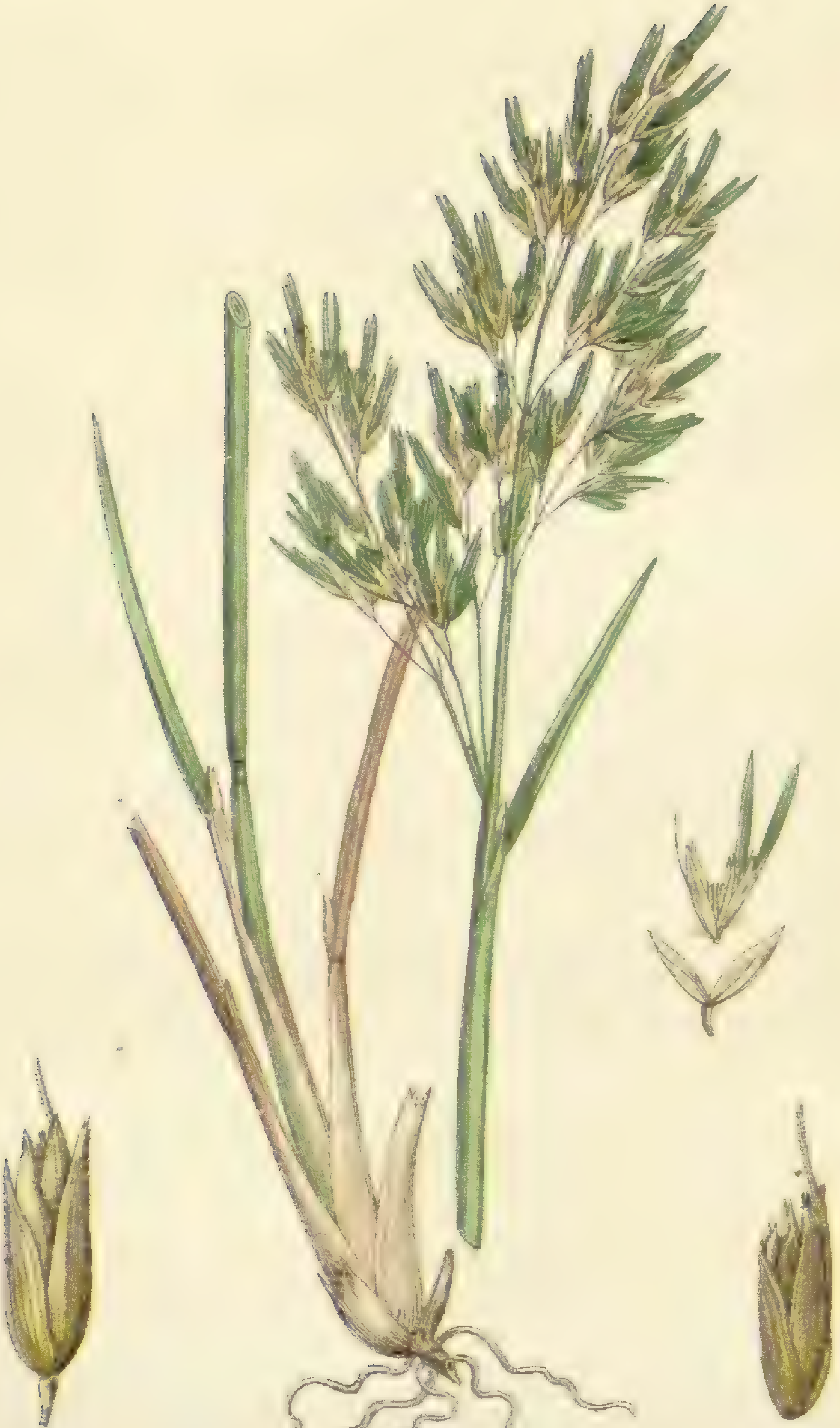
E. B. 1190.

Corynephorus canescens Grey Hair-grass.



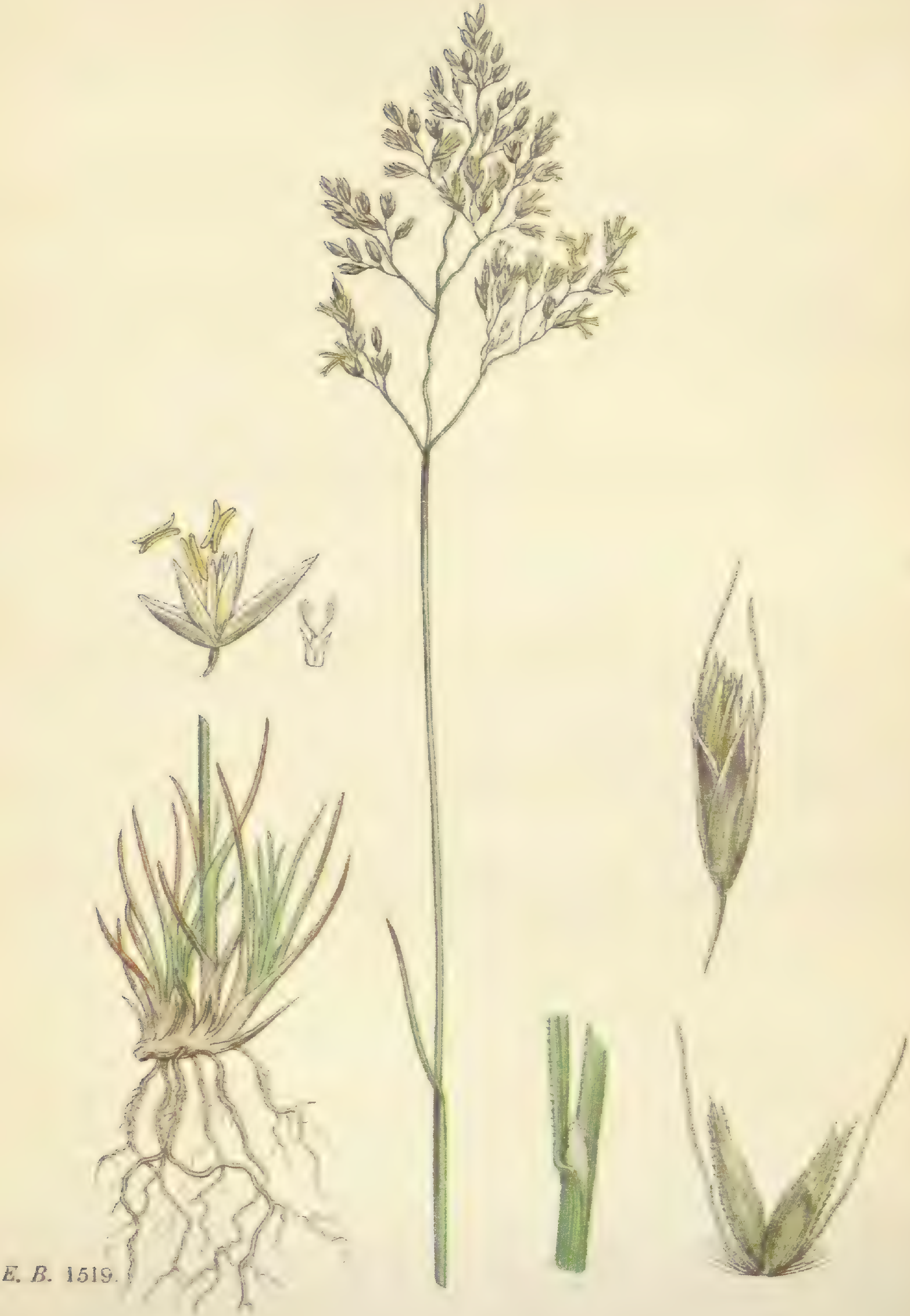
E. B. 1453.

Aira eu-cæspitosa.   Tufted Hair-grass.

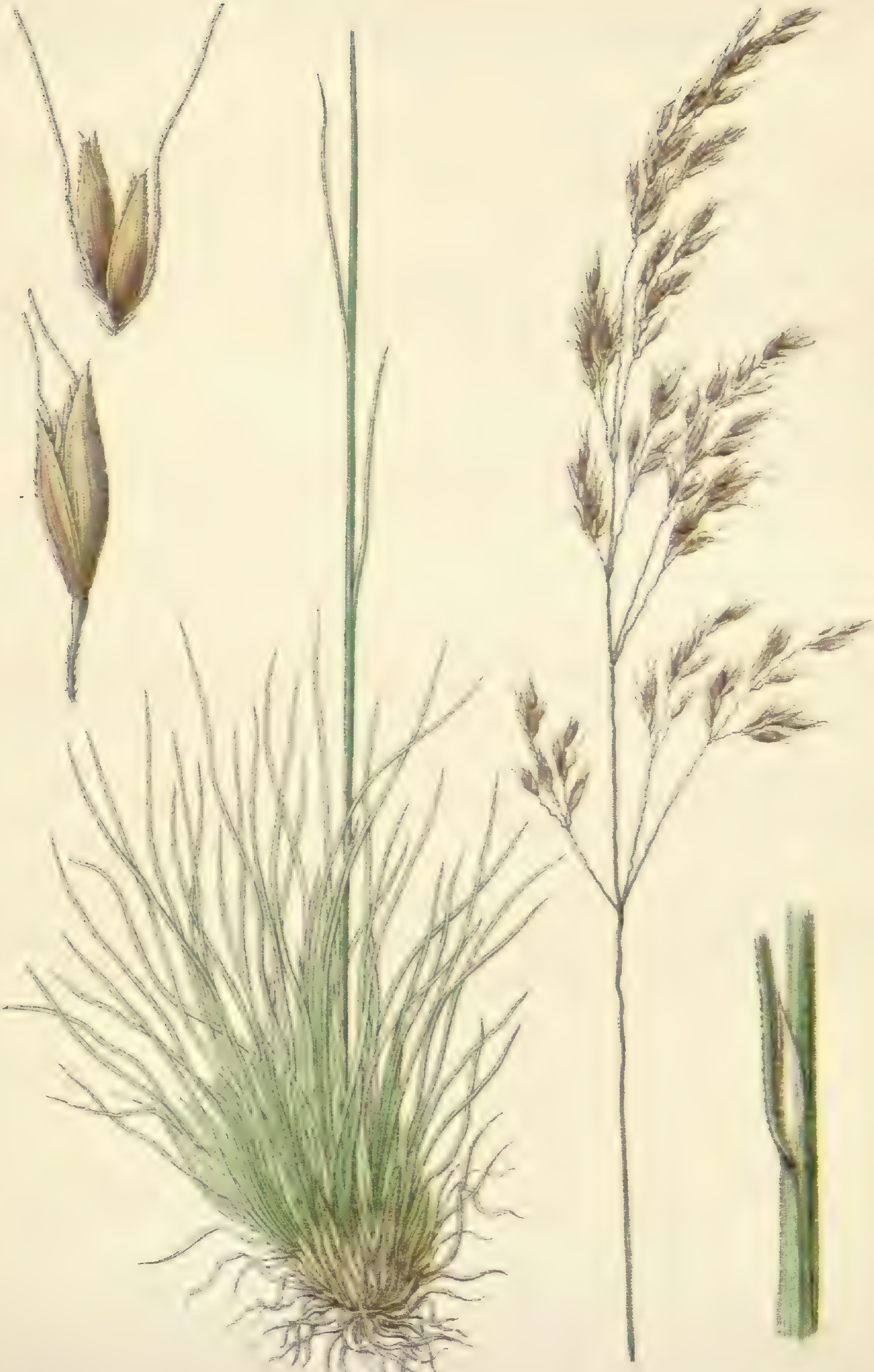


E. B. 2102.

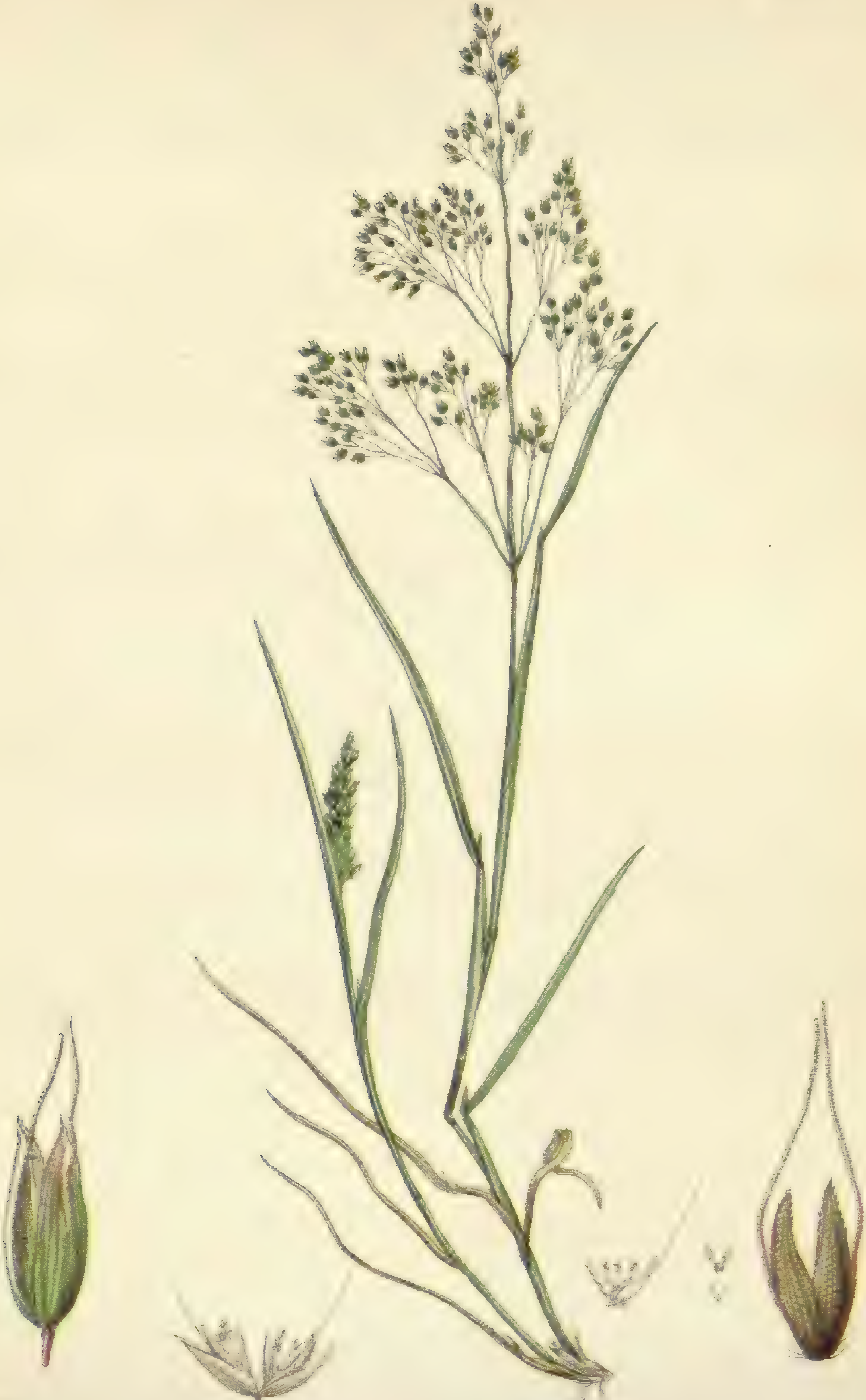
Aira alpina. Alpine Hair-grass.



Aira eu-flexuosa. Heath Hair-grass.

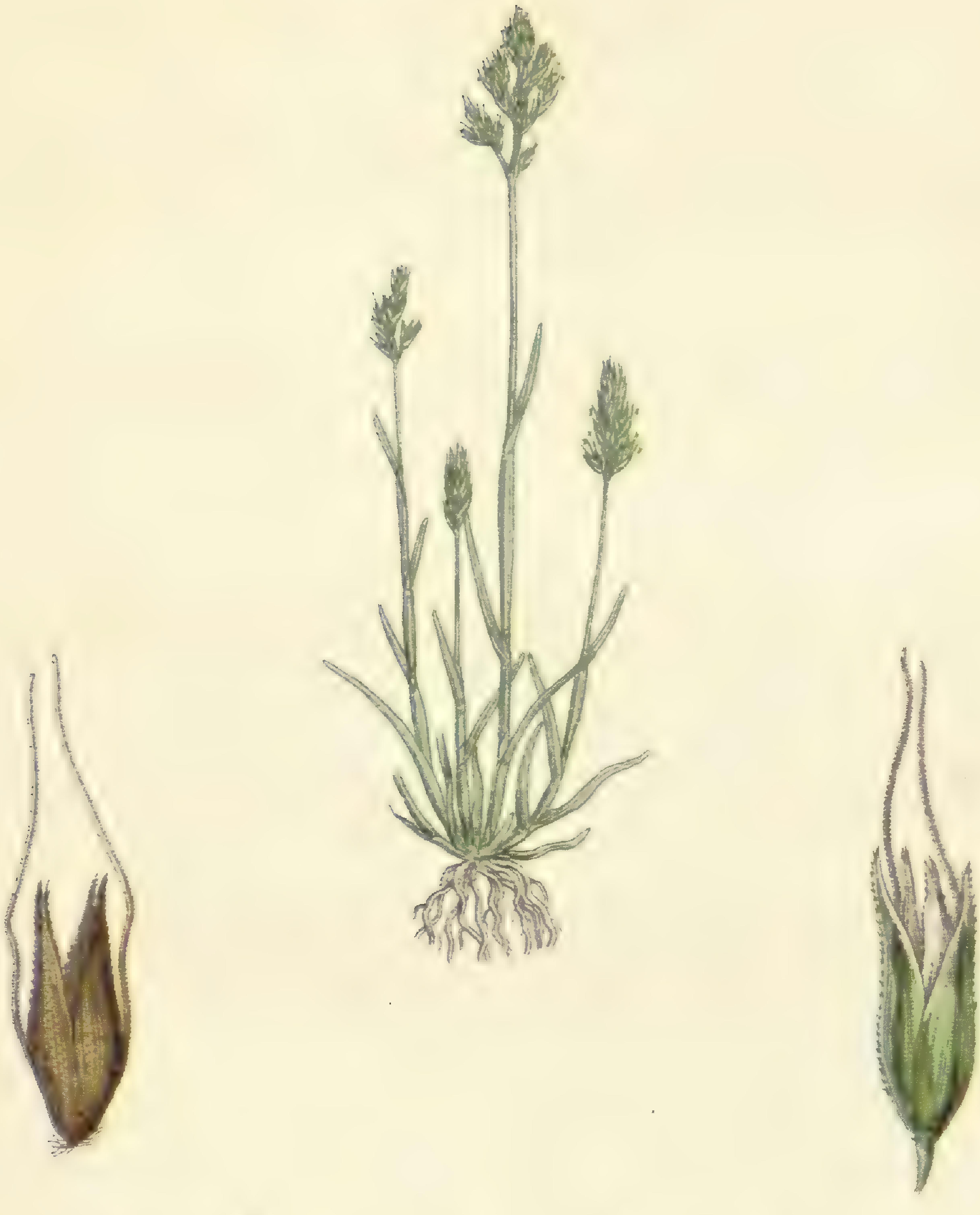


Aira uliginosa. Bog Hair-grass.



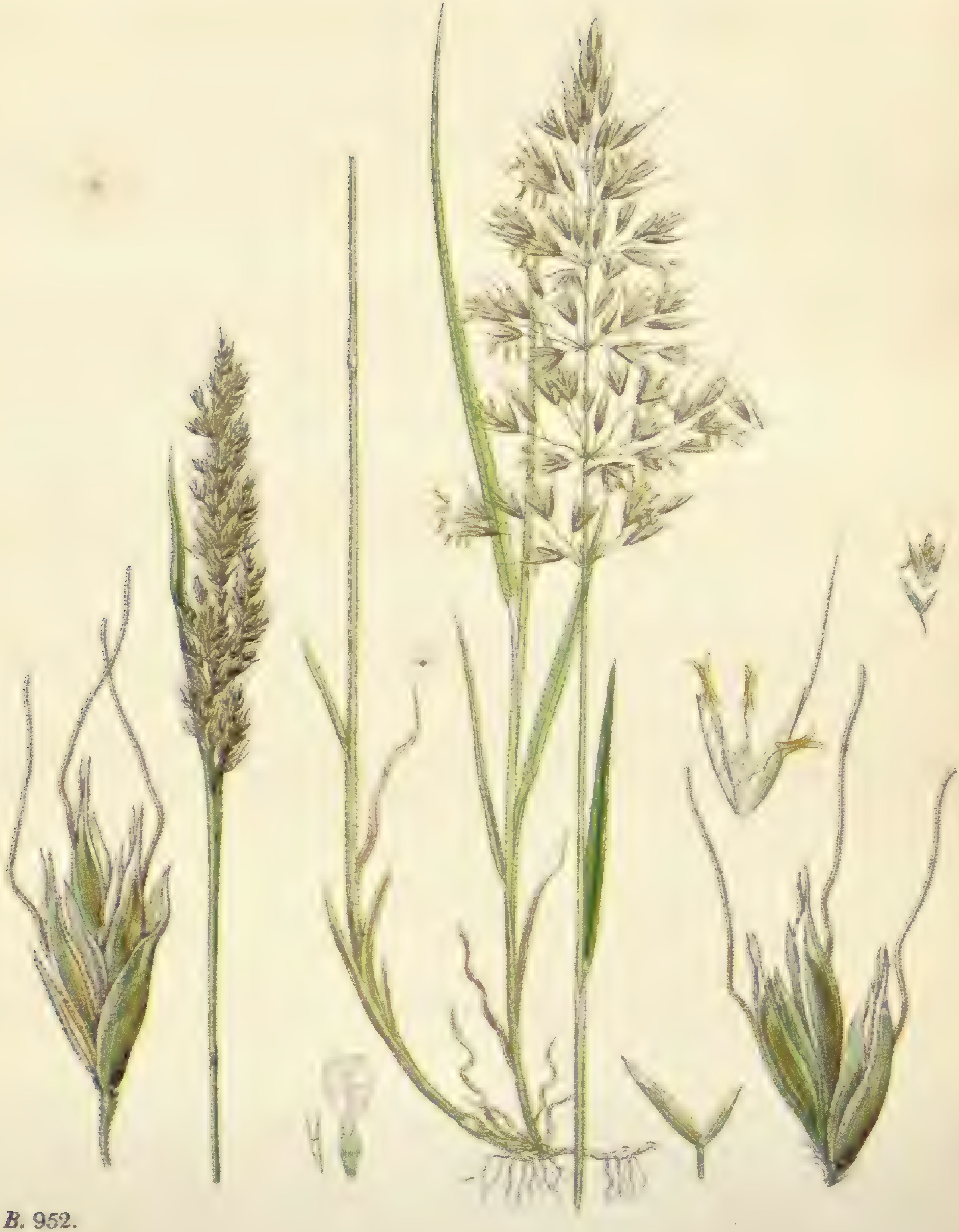
E. B. 812.

Aira caryophyllea. **Silvery Hair-grass.**



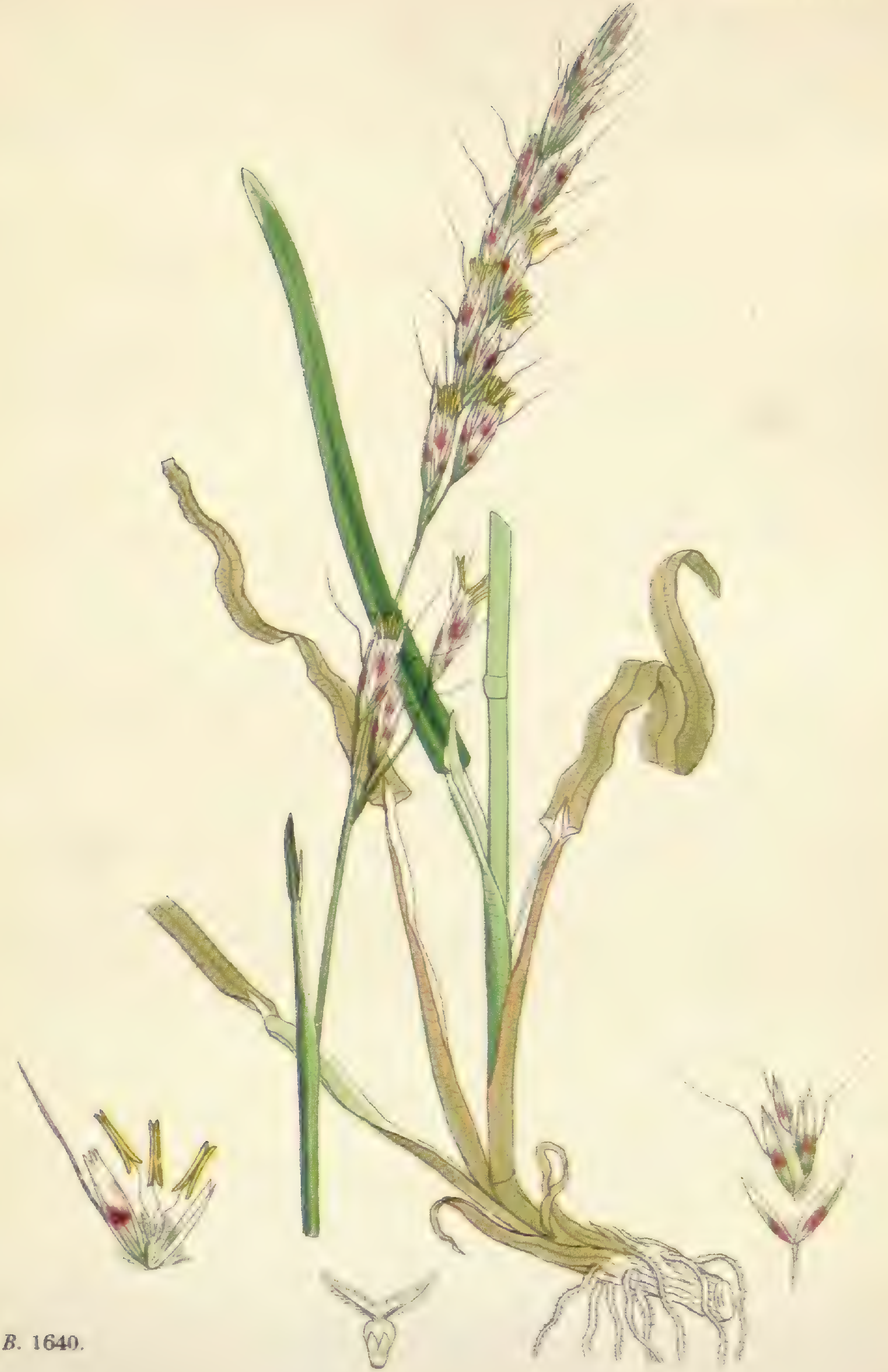
E. B. 1296.

Aira præcox. Early Hair-grass.



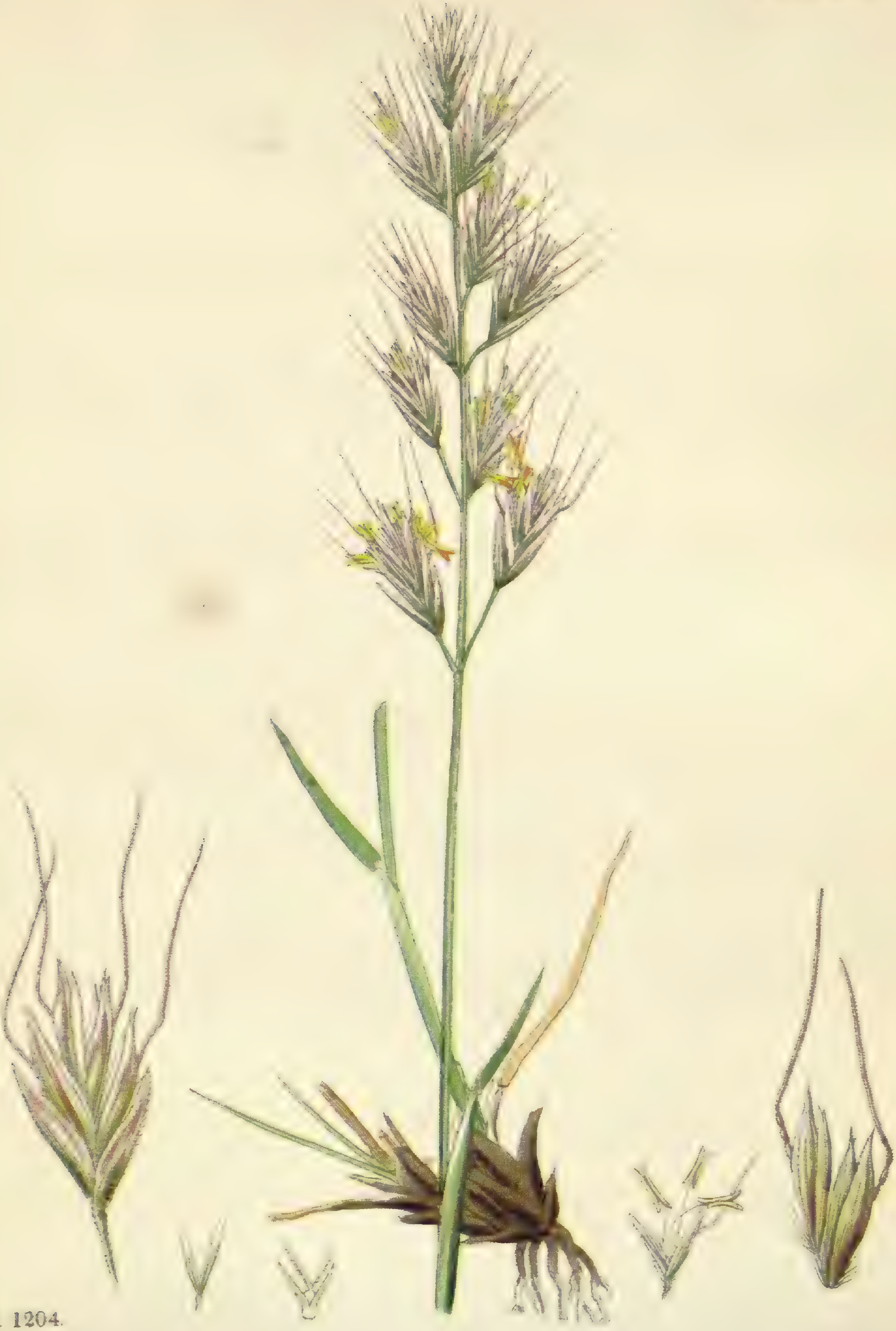
E. B. 952.

Avena flavescens. Yellow Oat-grass.



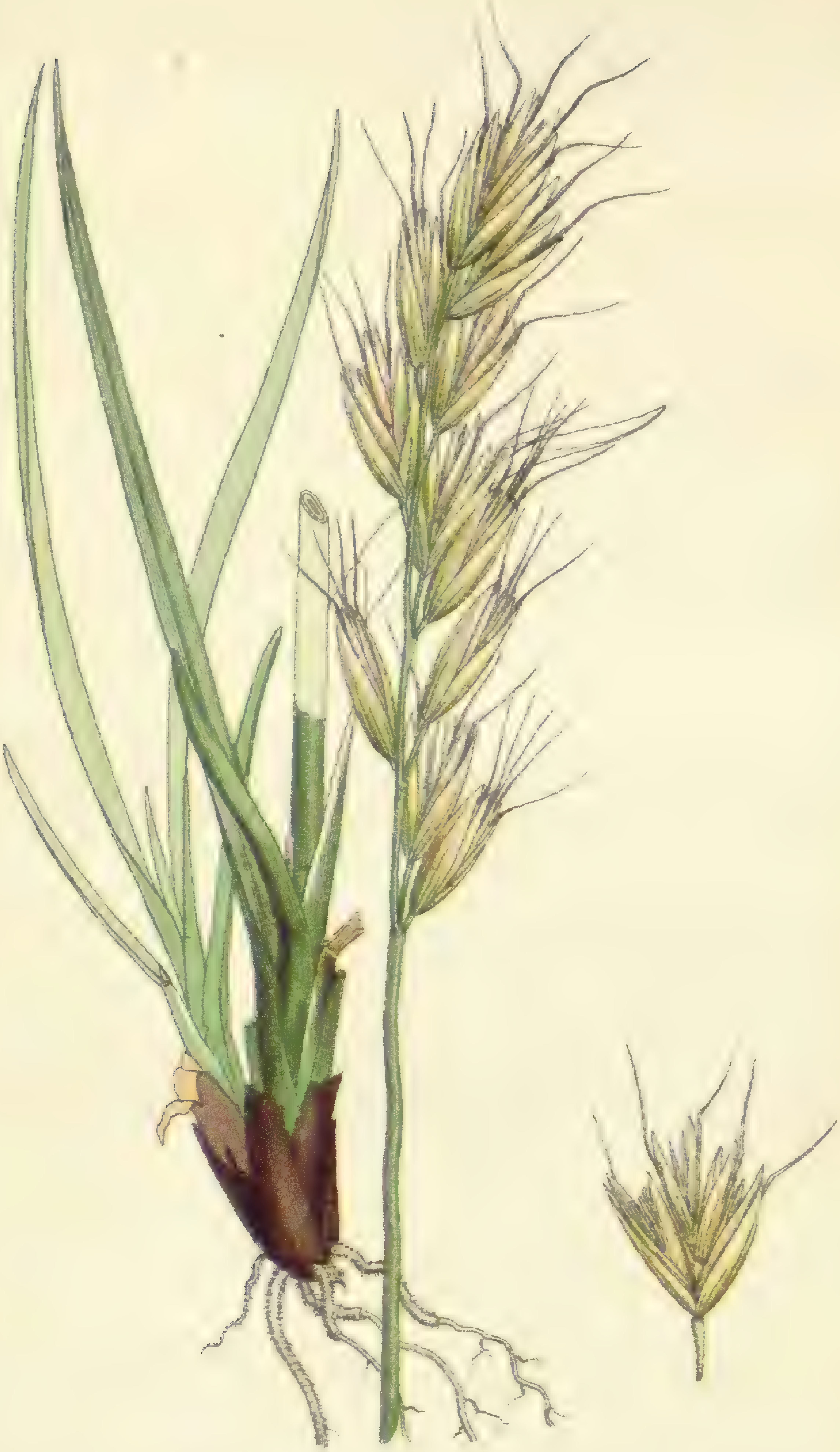
E. B. 1640.

Avena pubescens. **Downy Oat-grass.**



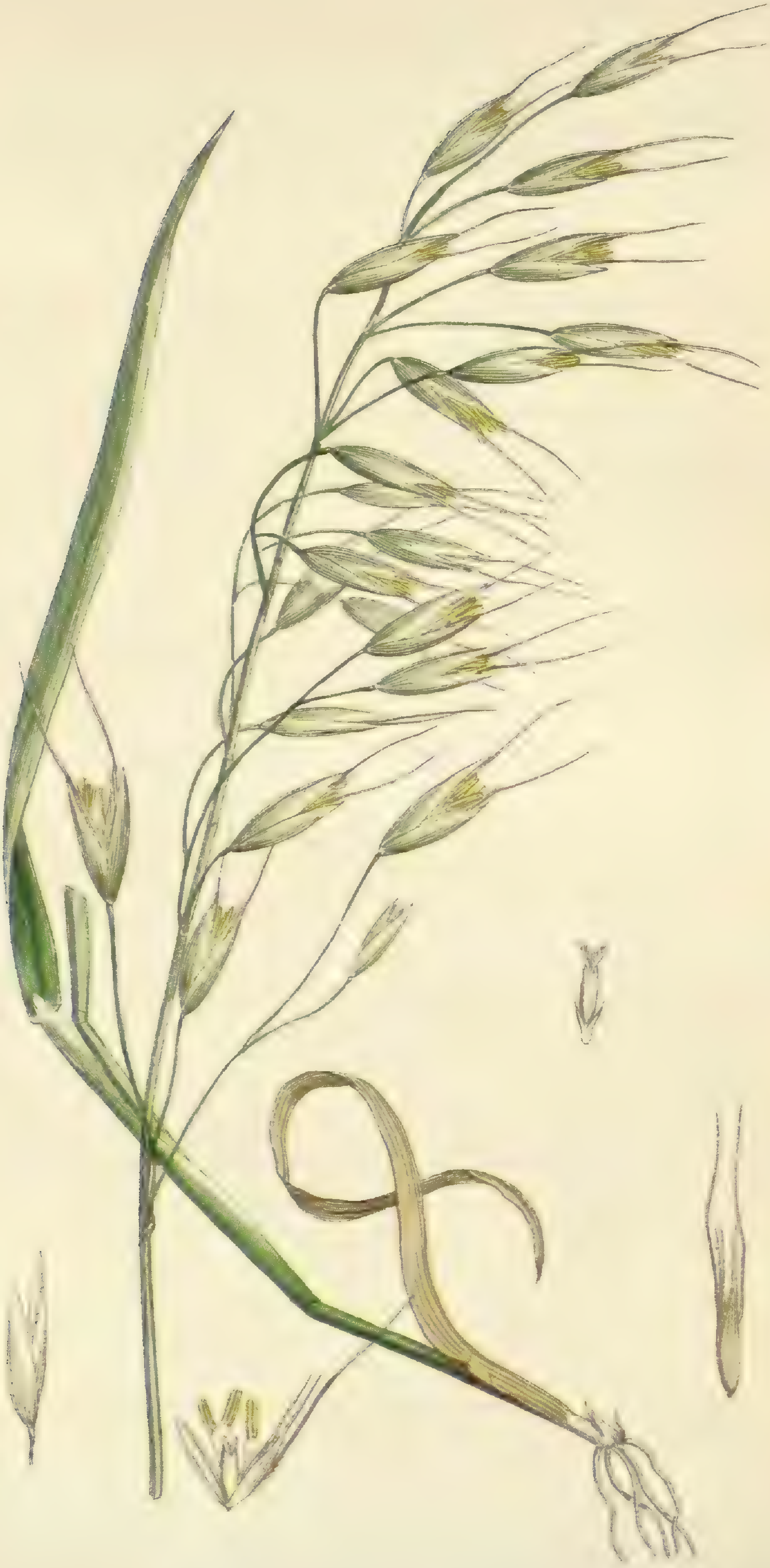
E. B. 1204.

Avena pratensis, var. genuina. Glabrous Oat-grass, var. *a*.



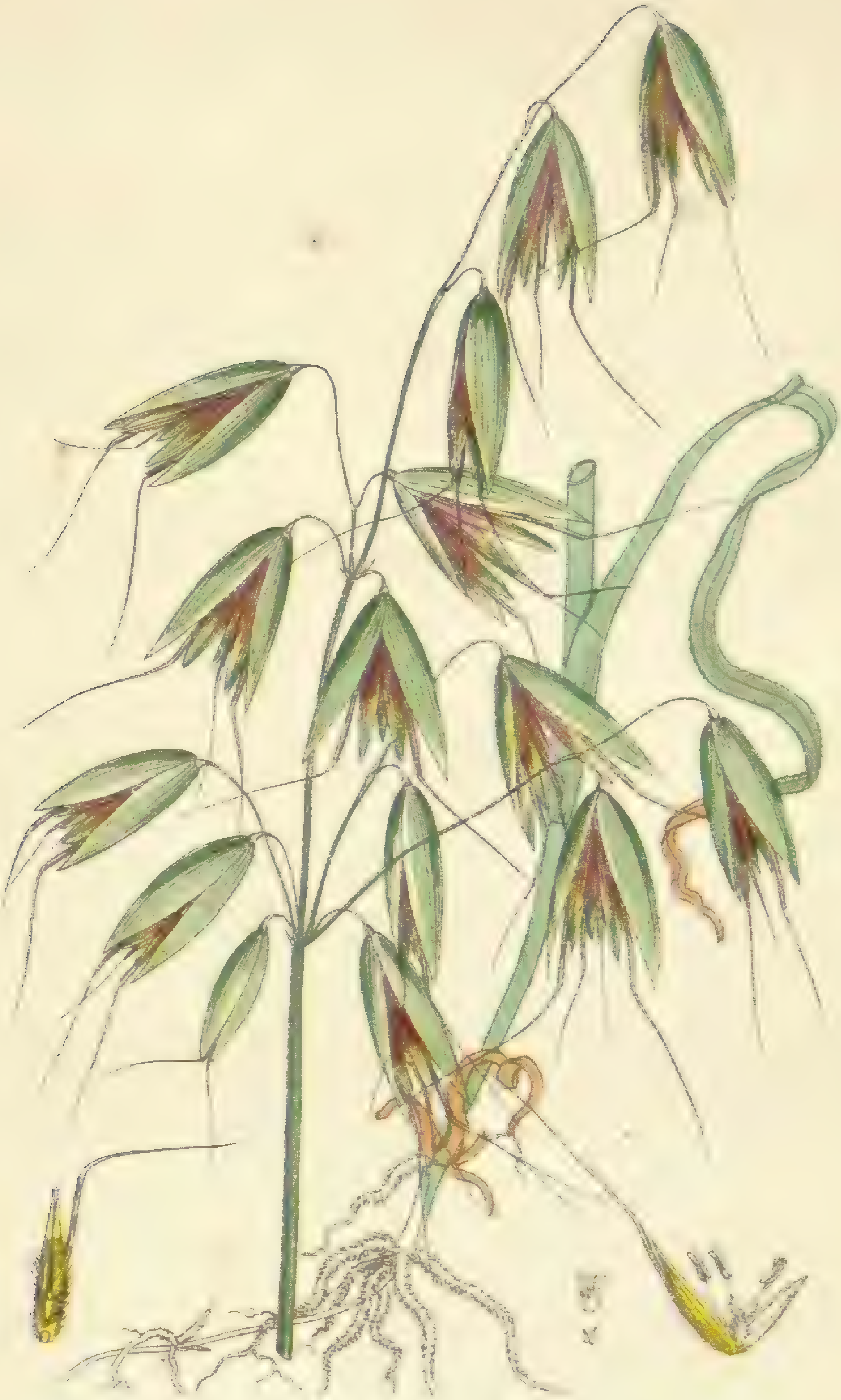
E. B. 2141.

Avena pratensis, var. alpina.   Glabrous Oat-grass, var. β.



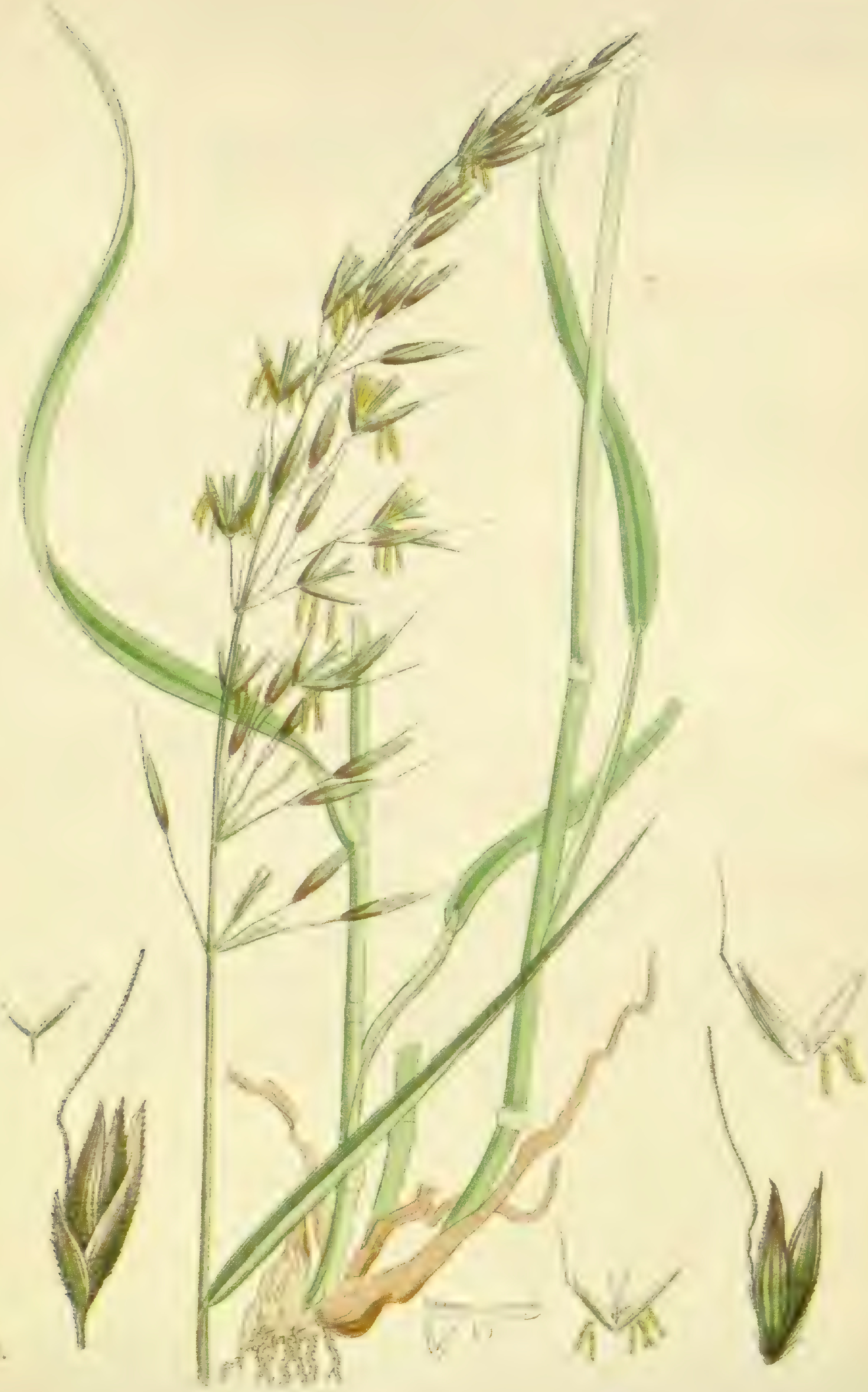
E. B. 1266.

Avena strigosa. Black Oat.



E. B. 2221.

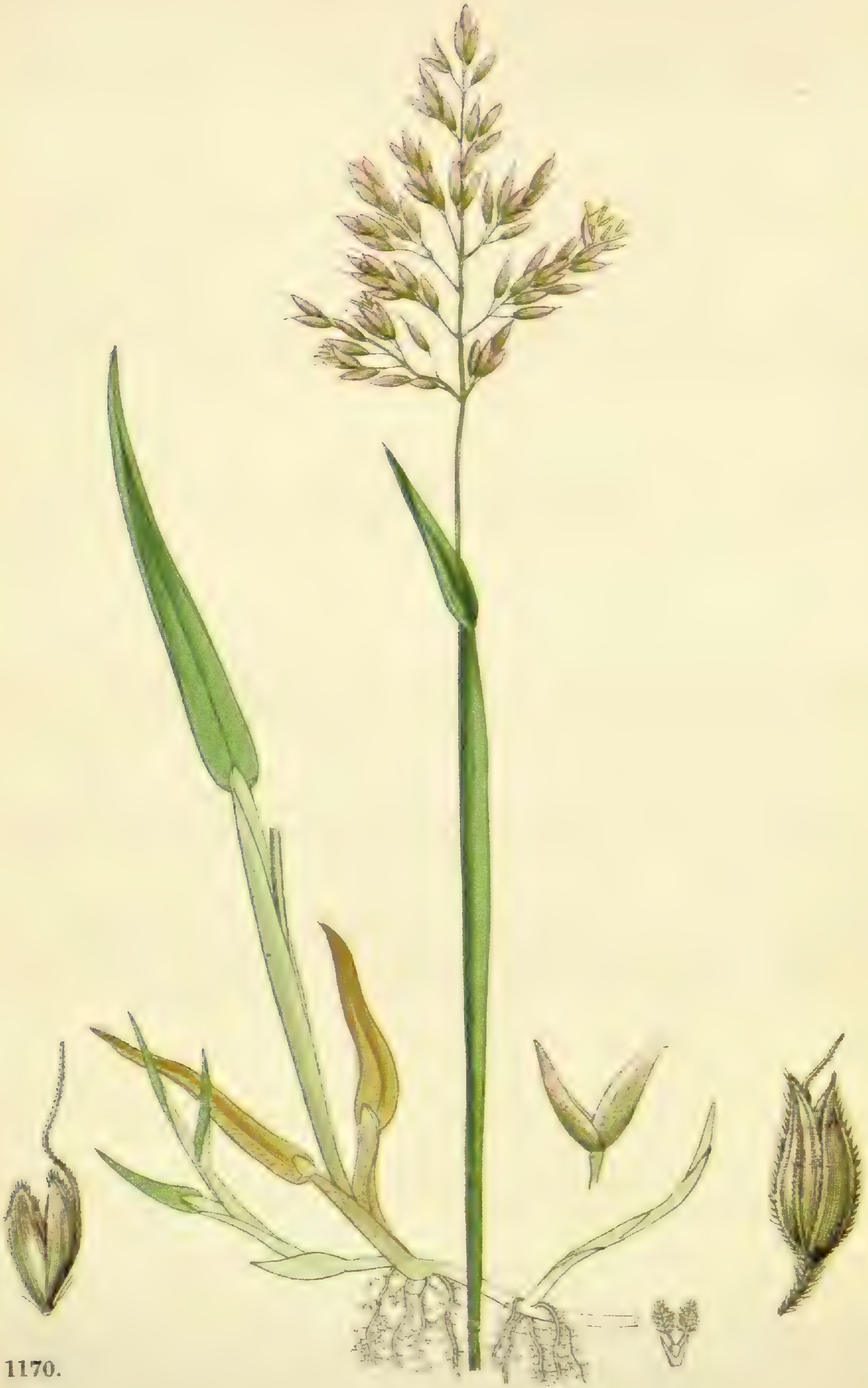
Avena fatua. Wild Oat.



E. B. 813.

Avena elatior. False Oat-grass.

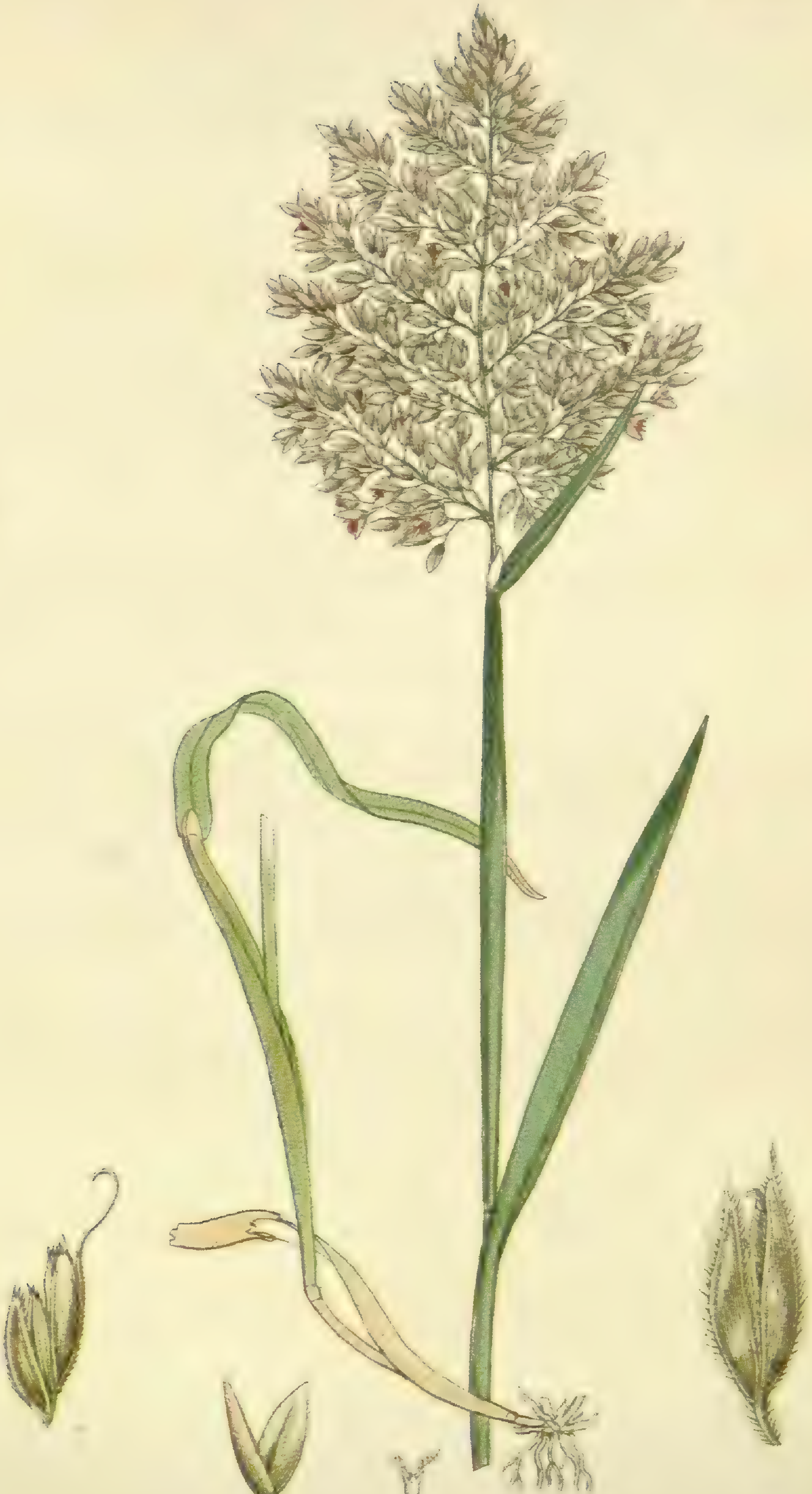
* MDCCXLIII.



E. B. 1170.

Holcus mollis. Creeping Soft-grass.

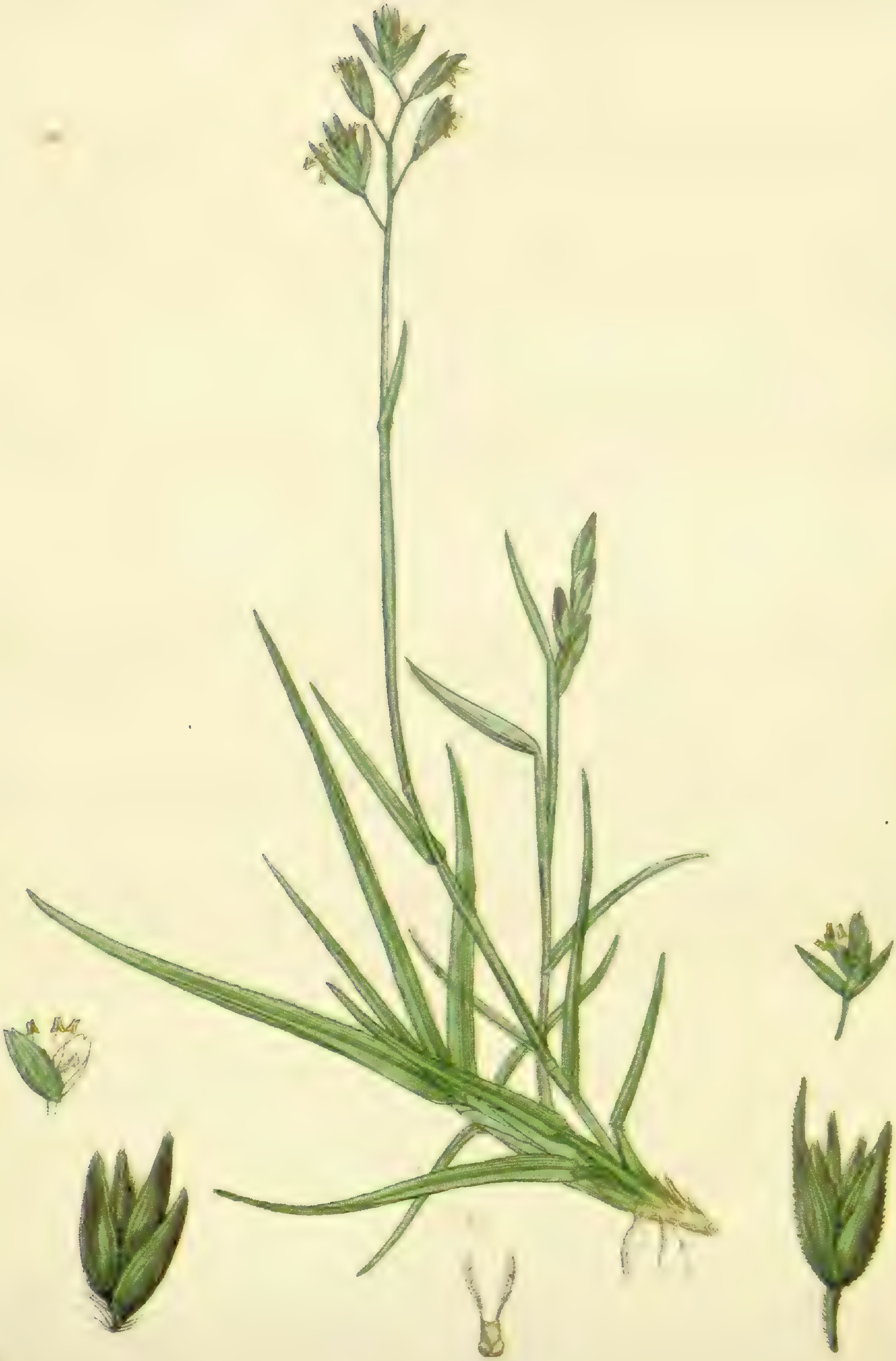
MDCCXLIV.



E. B. 1169.

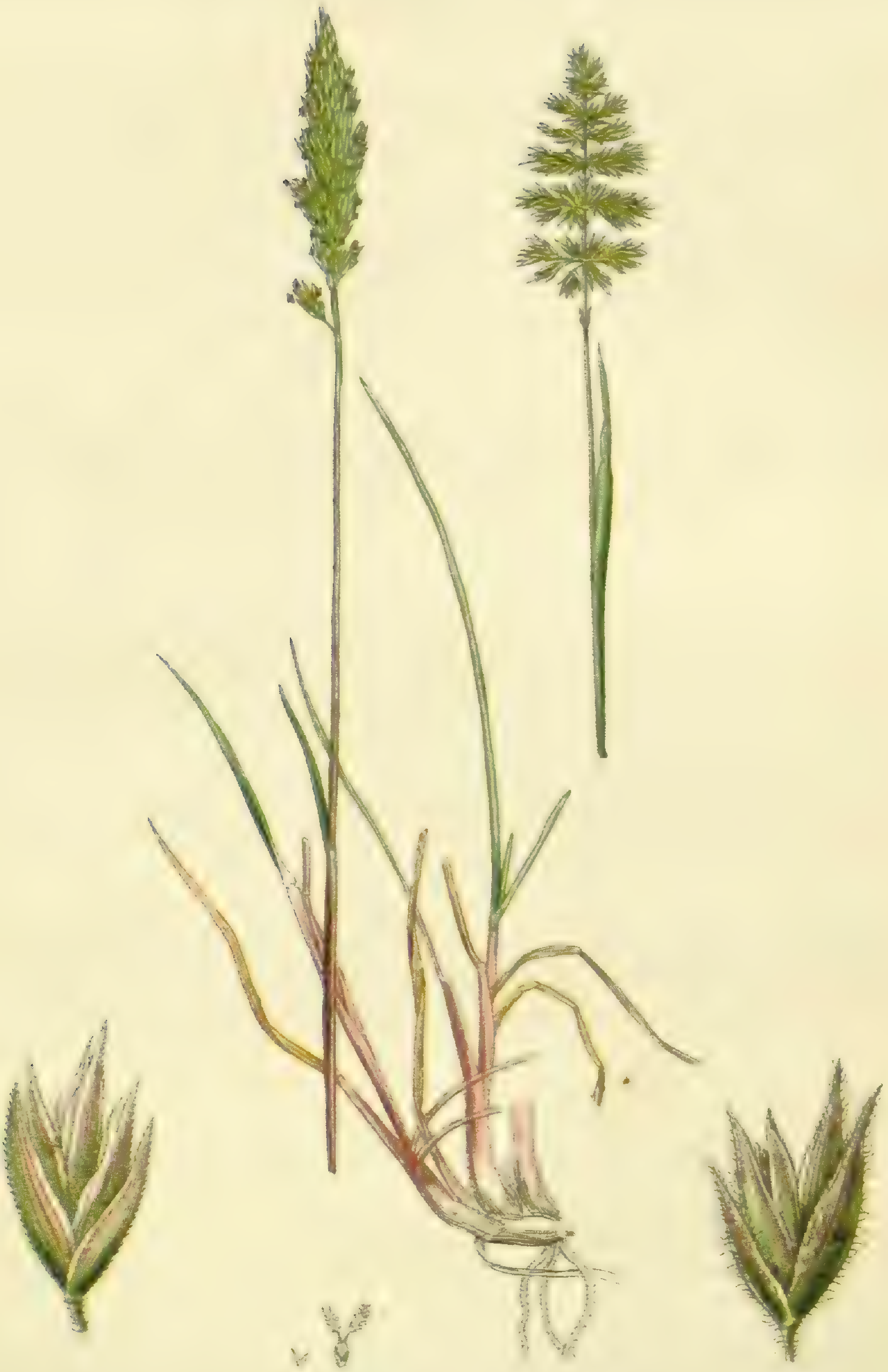
Holcus lanatus. Yorkshire Fog.

MDCCXLV.



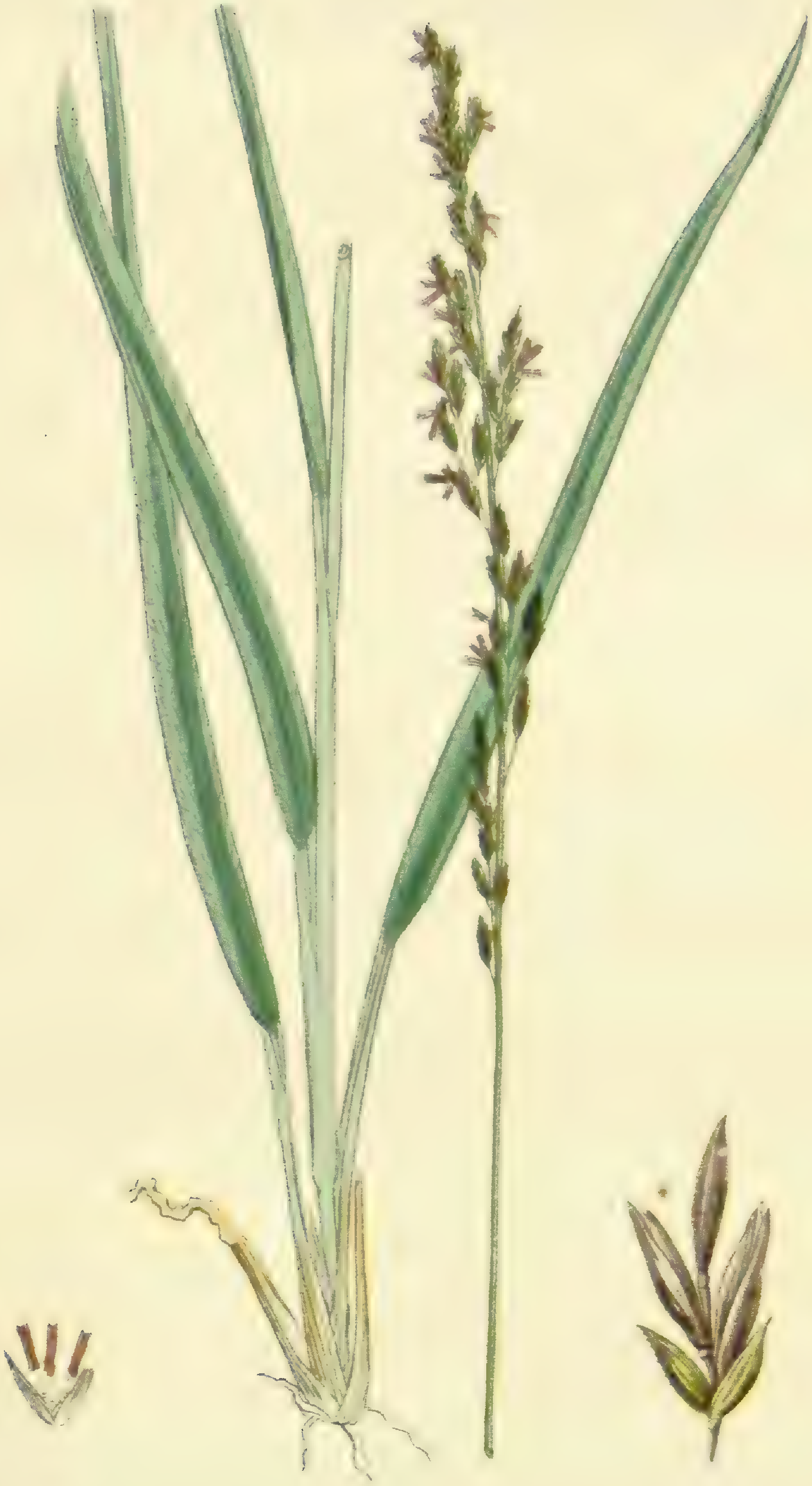
E. B. 792.

Triodia decumbens.   Decumbent Heath-grass.



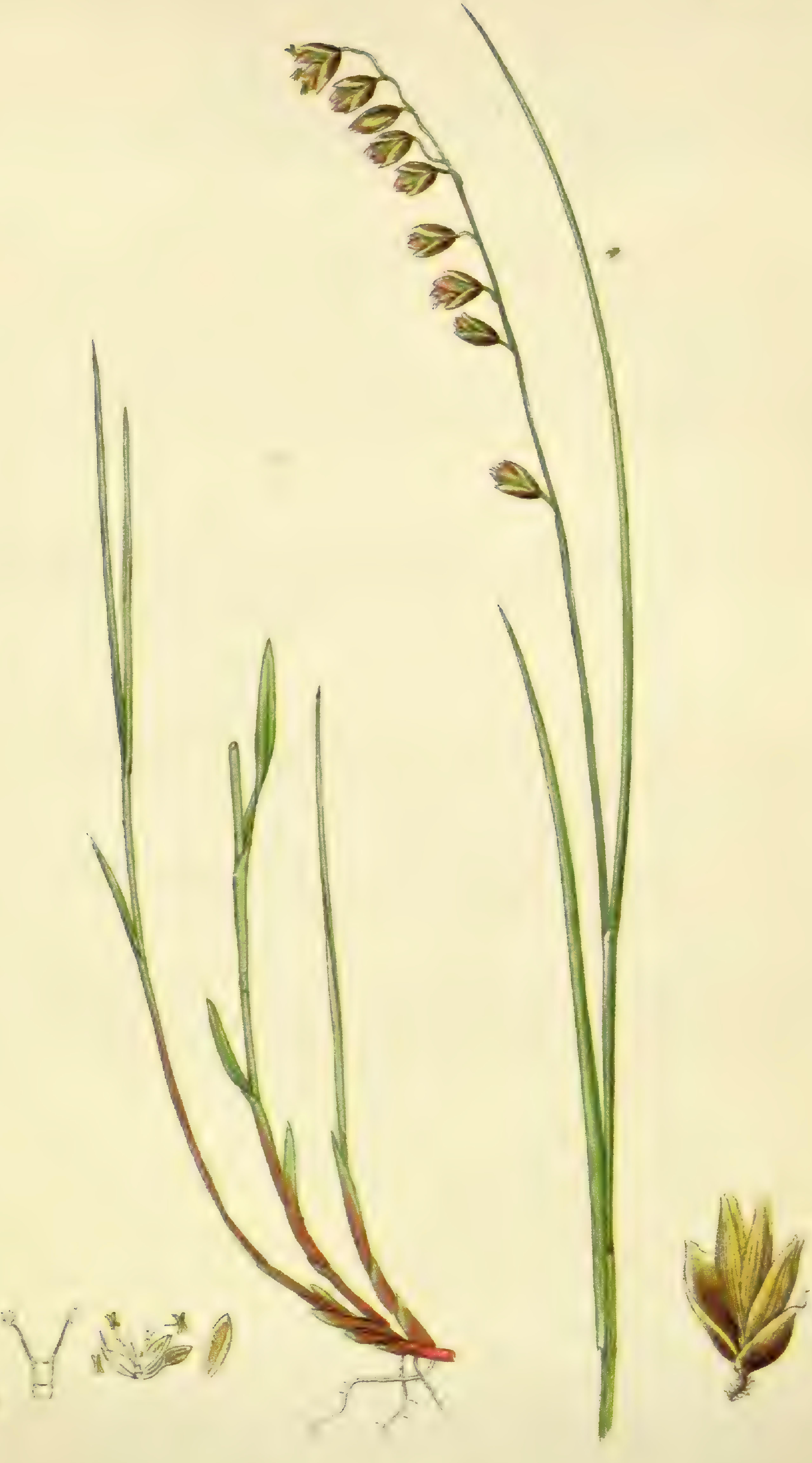
E. B. 648.

Köleria cristata. Crested Hair-grass.



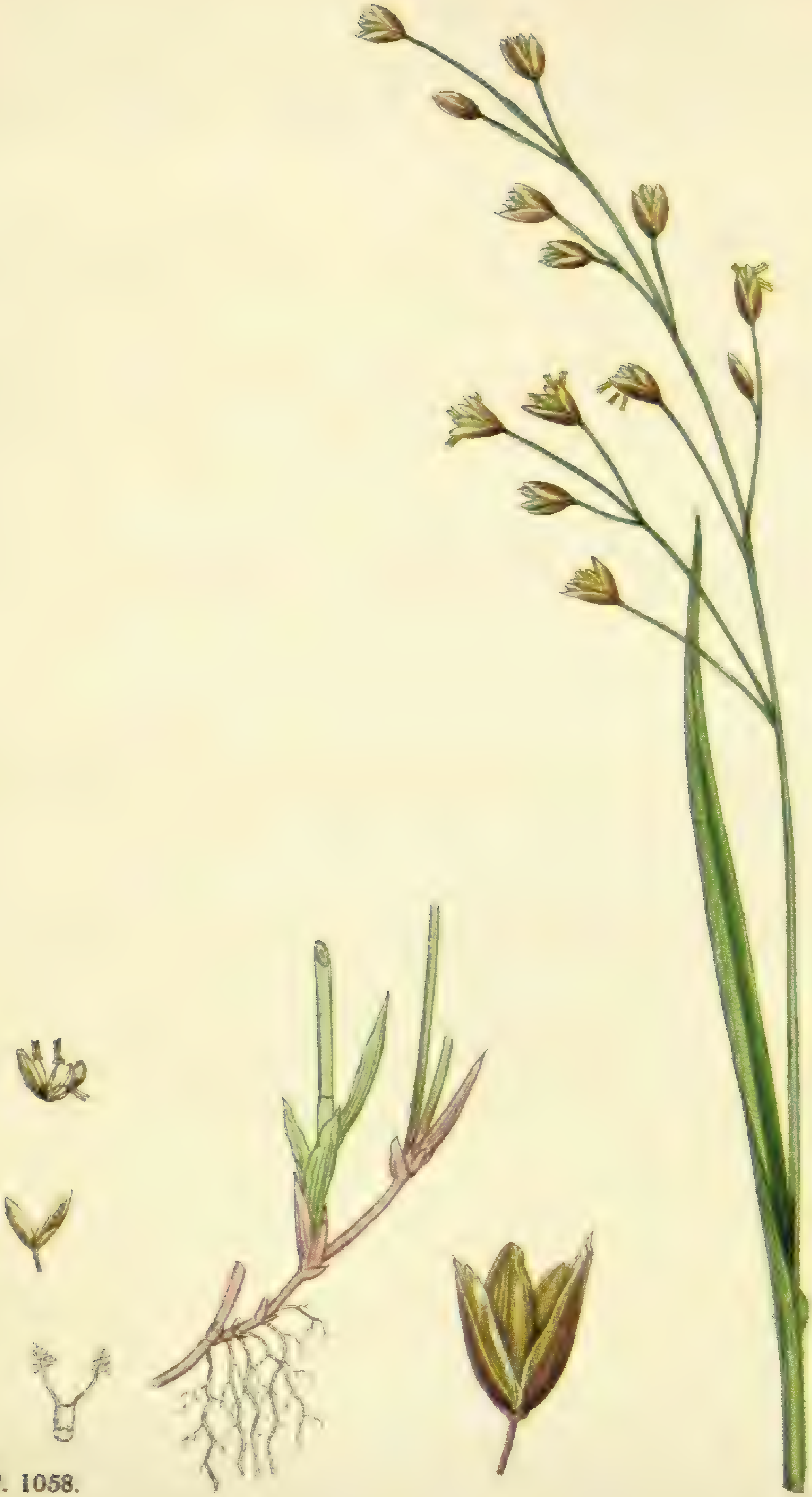
E. B. 750.

Molinia cærulea. Purple Melic-grass.



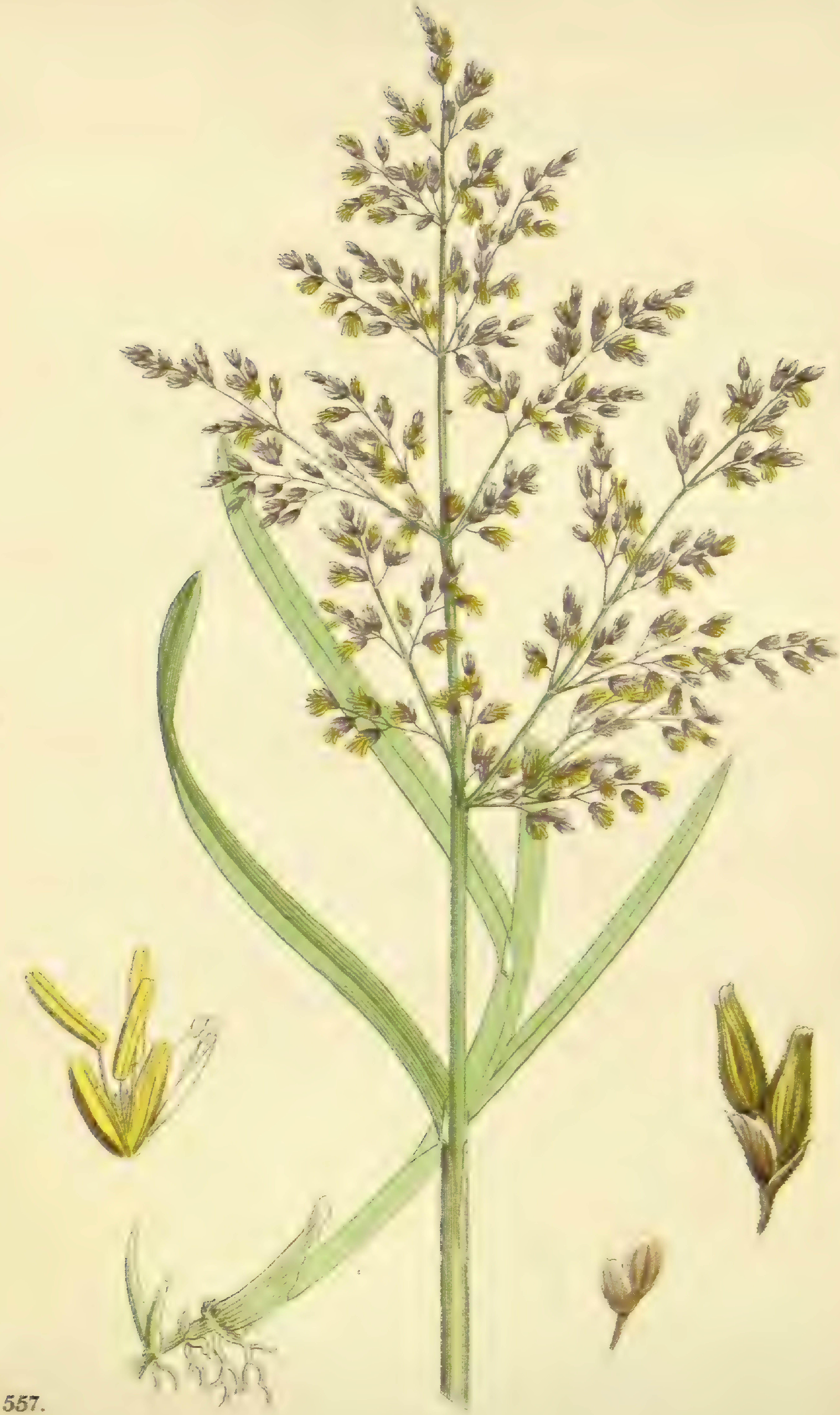
E. B. 1059.

Melica nutans. Nodding Melic-grass.



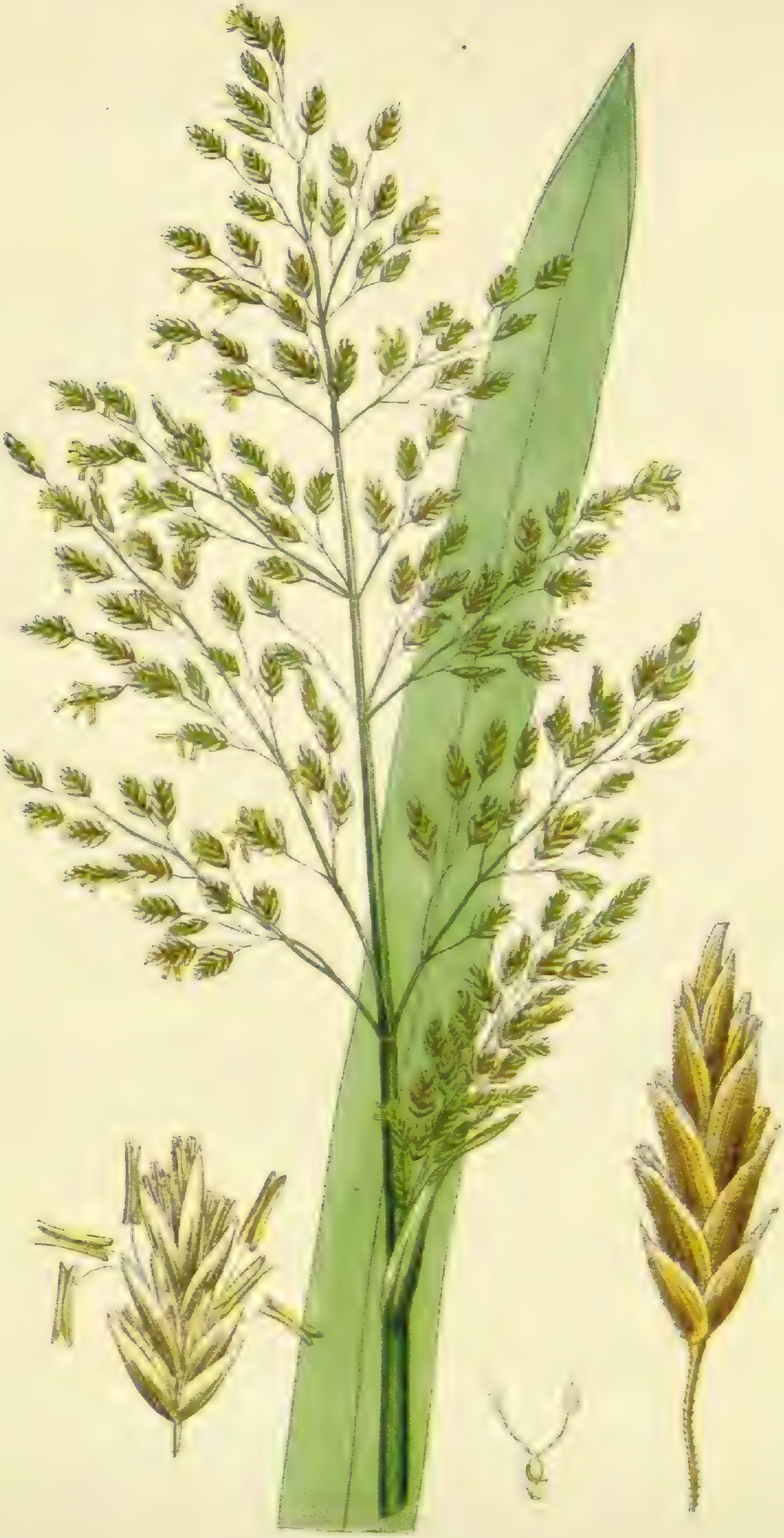
E. B. 1058.

Melica uniflora. Wood Melic-grass.



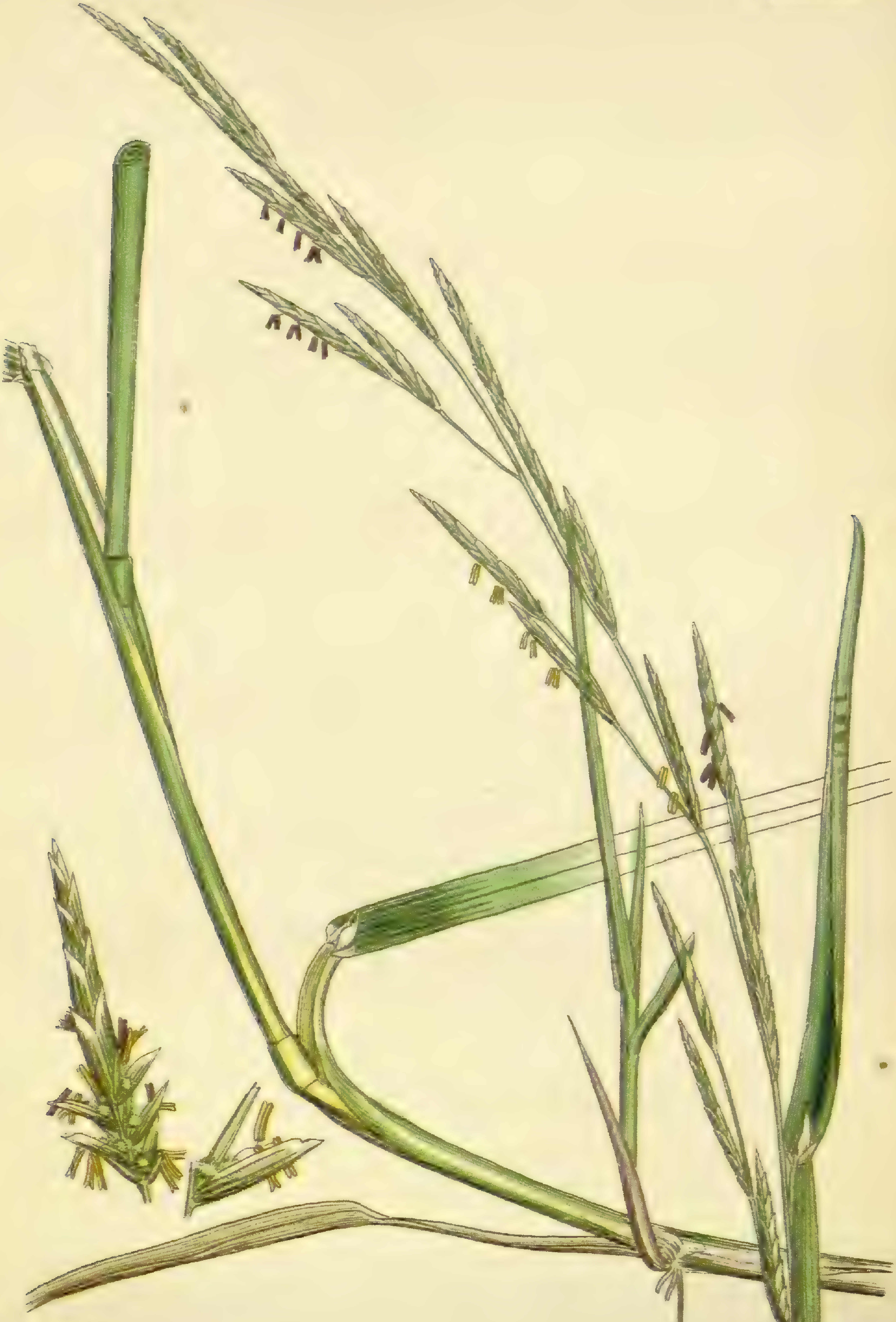
E. B. 1557.

Catabrosa aquatica. Water Whorl-grass.



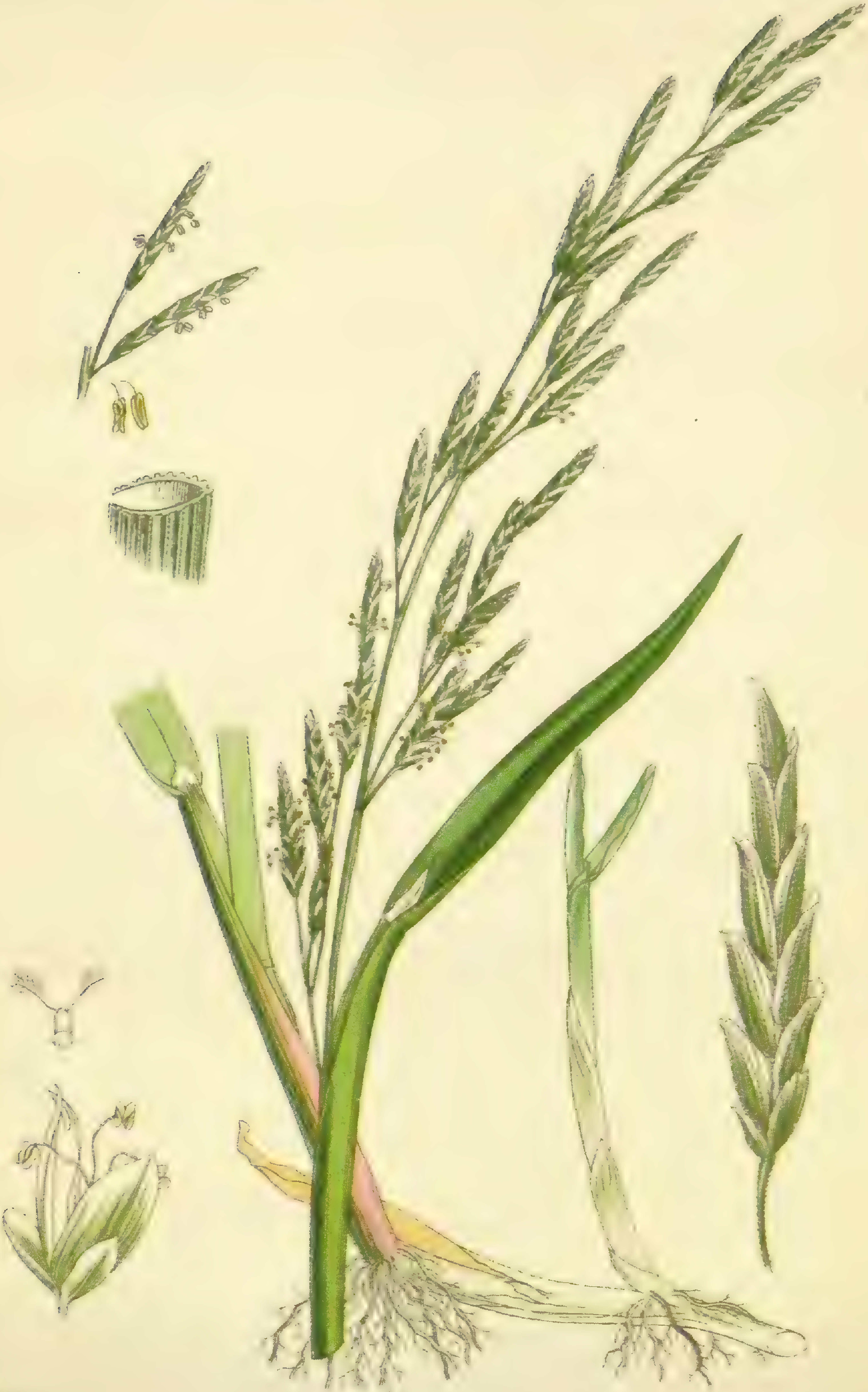
E. B. 1315.

Glyceria aquatica. Reed Meadow-grass.



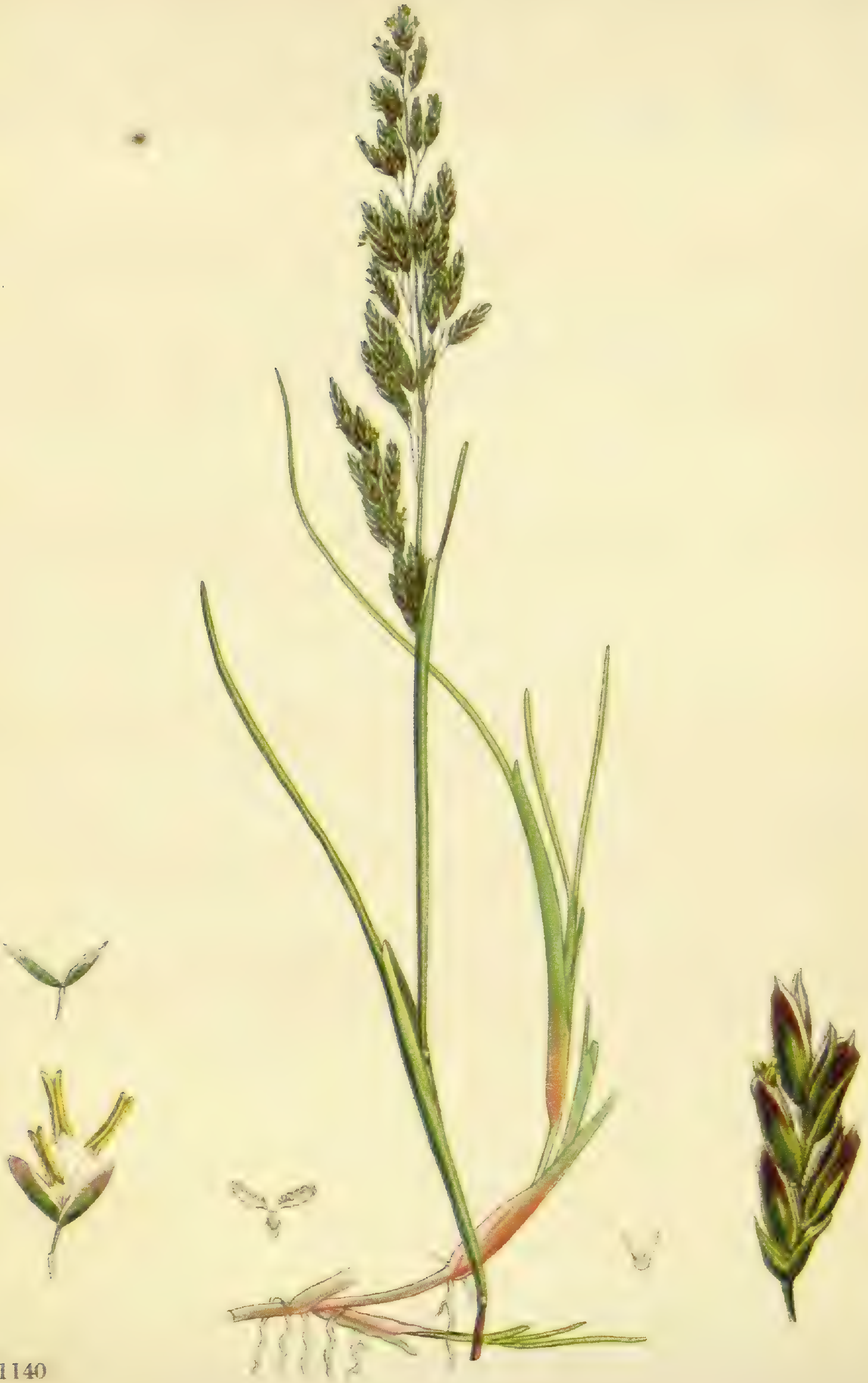
E. B. S. 2975.

Glyceria eu-fluitans. Floating Meadow-grass.



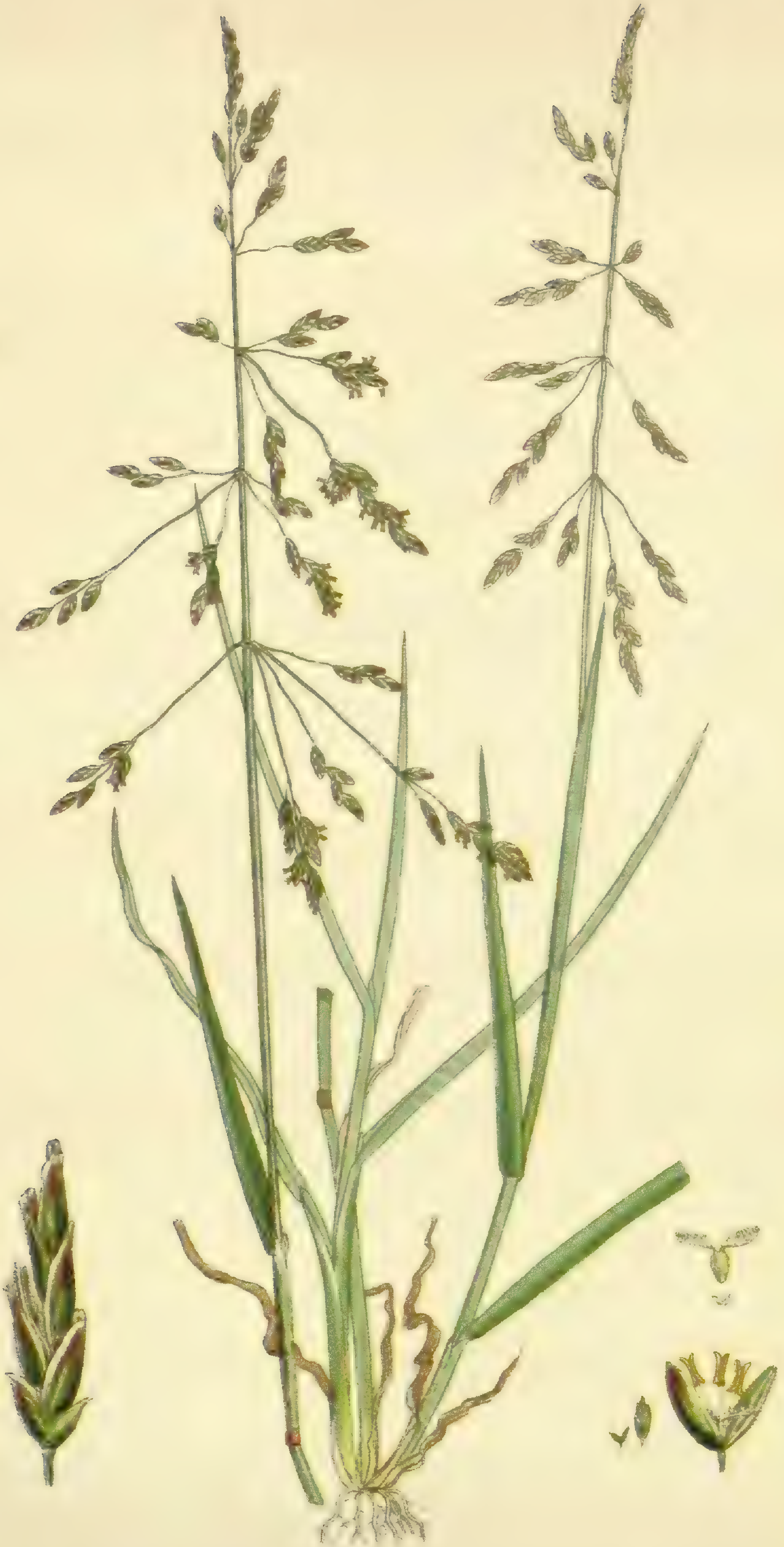
E. B. 1520

Glyceria plicata.　Folded-leaved Meadow-grass.



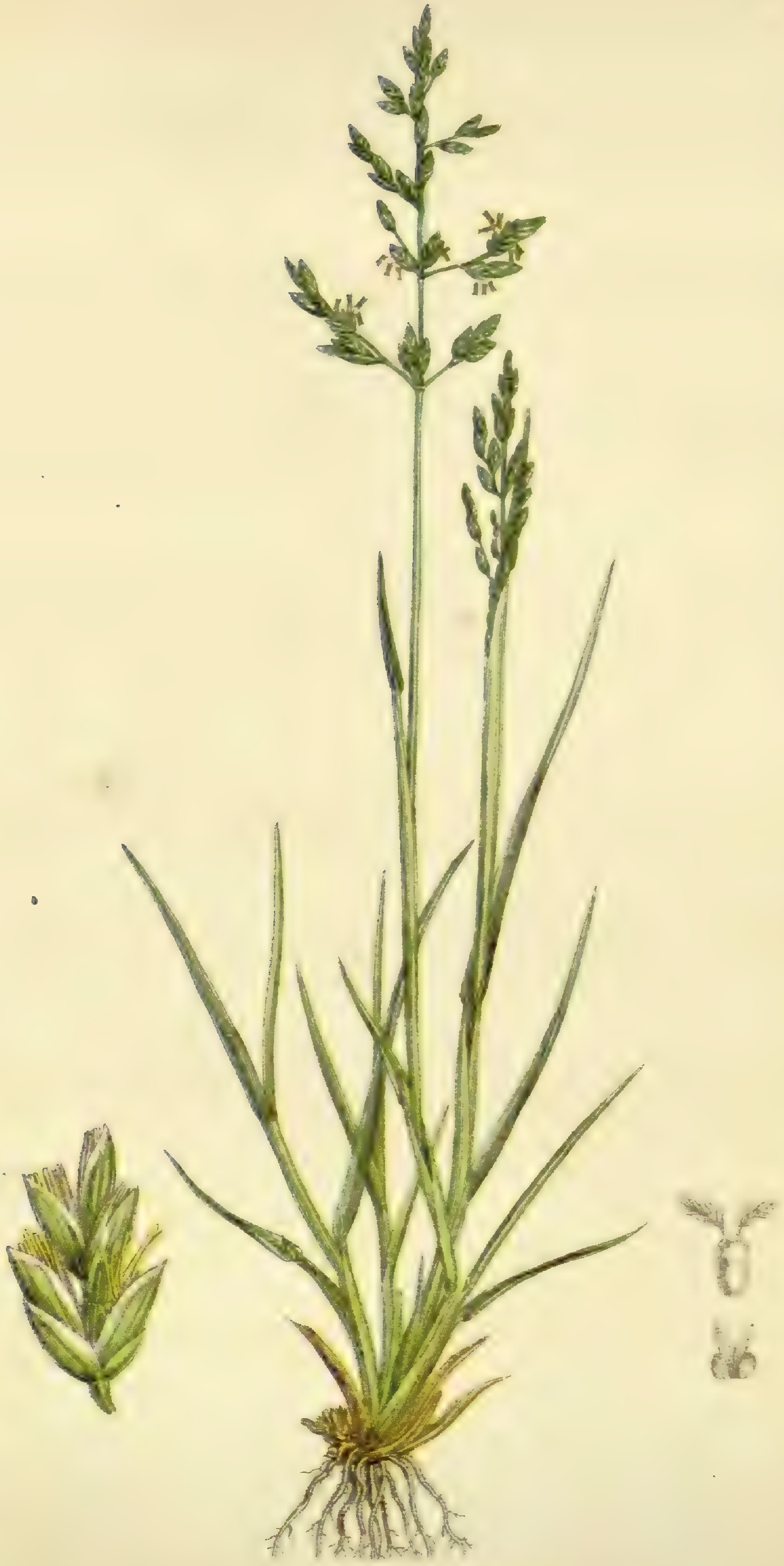
E. B. 1140

Sclerochloa maritima. **Creeping Sea Meadow-grass.**



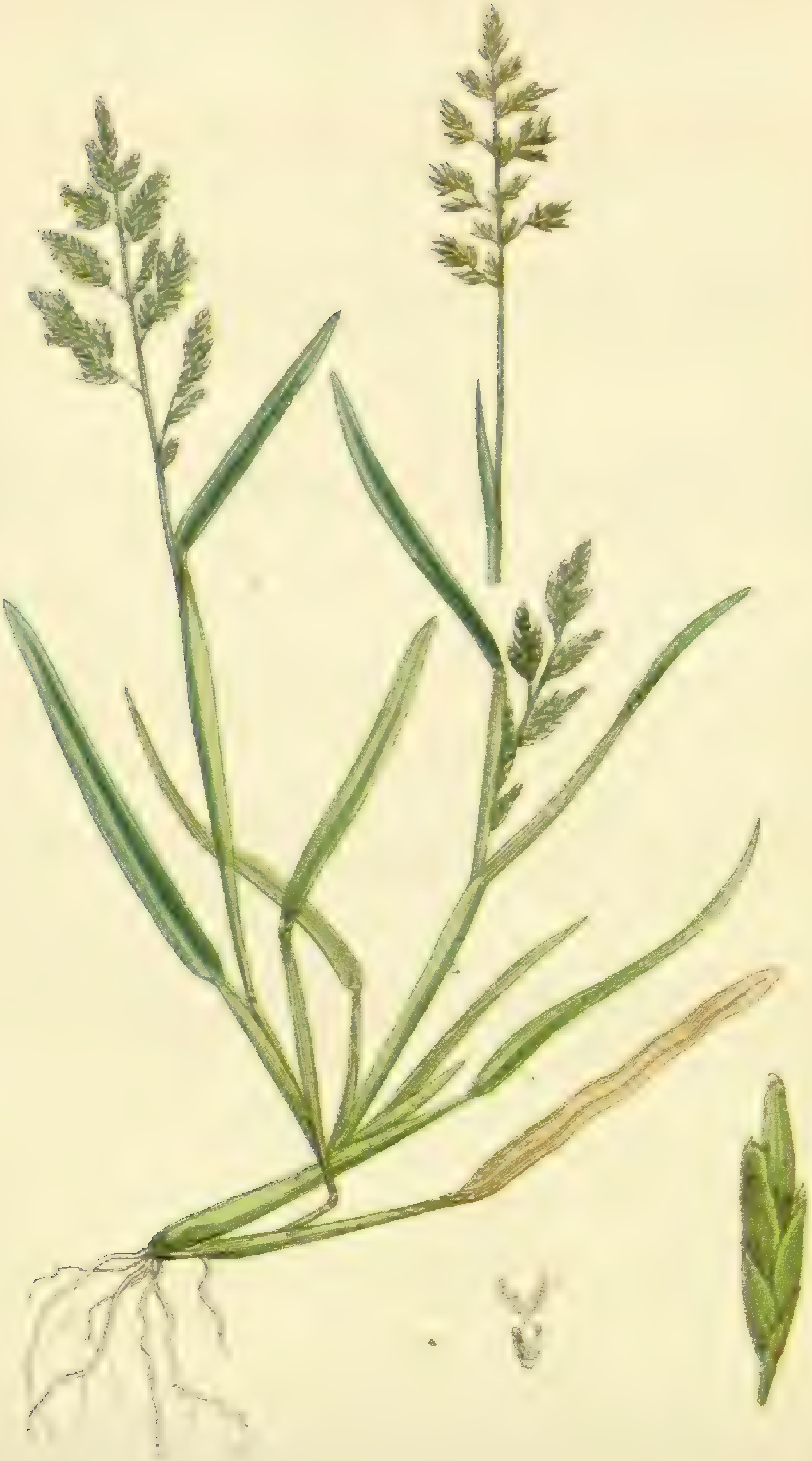
E. B. 986.

Sclerochloa eu-distans. Reflexed Meadow-grass.



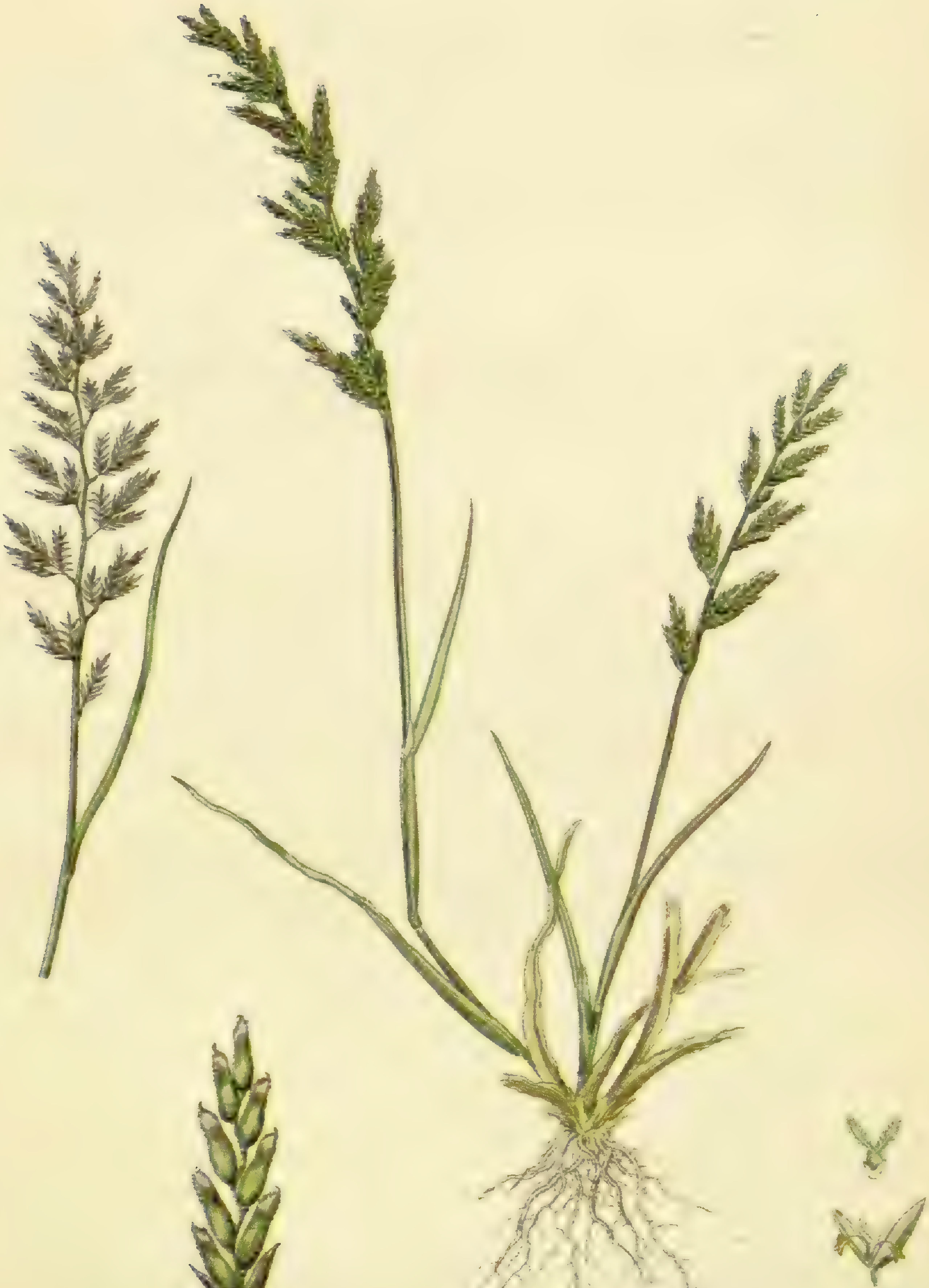
E. B. S. 2797.

Sclerochloa Borreri.   Borrer's Meadow-grass.



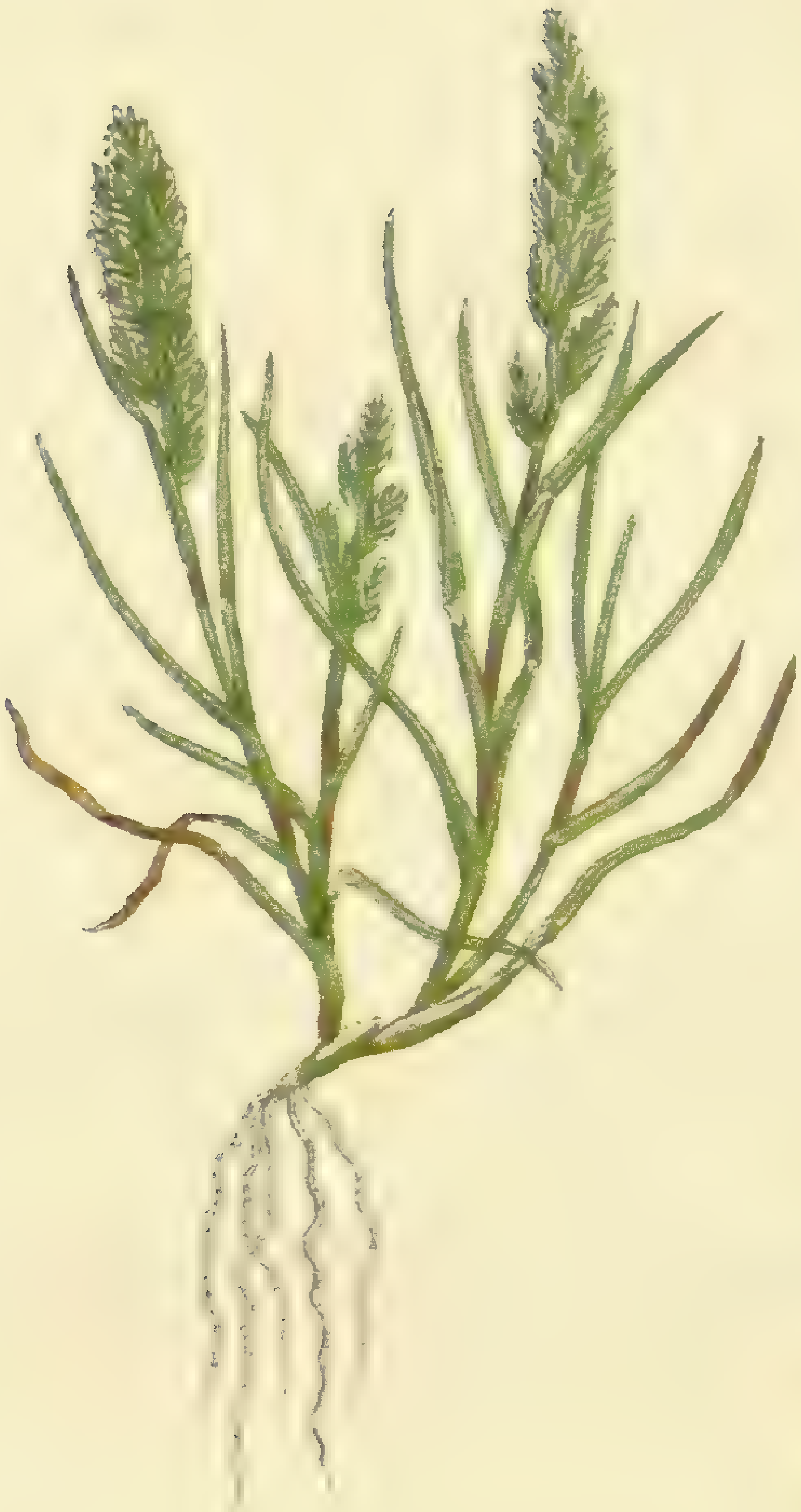
E. B. 532

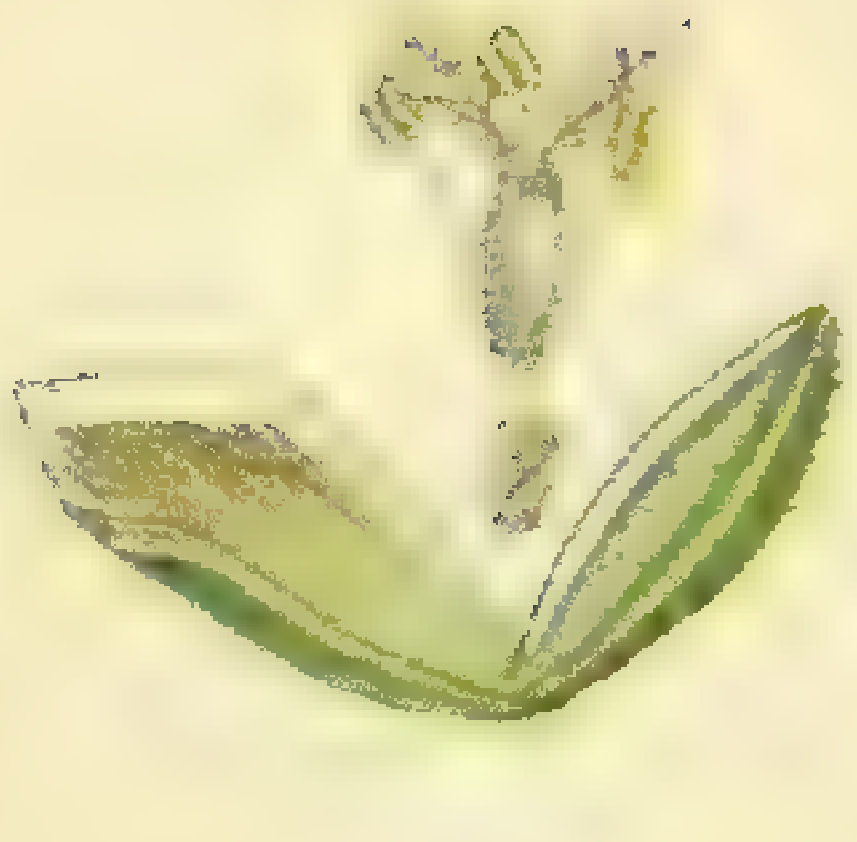
Sclerochloa procumbens. Procumbent Meadow-grass.

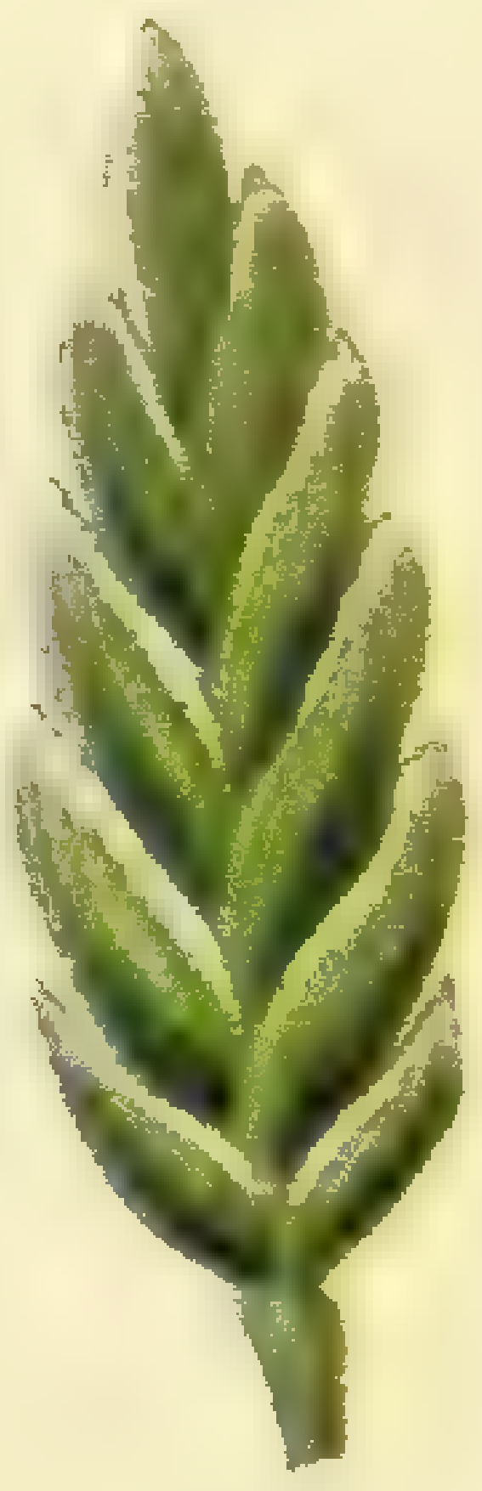


E. B. 1371.

Sclerochloa rigida. Hard Meadow-grass.

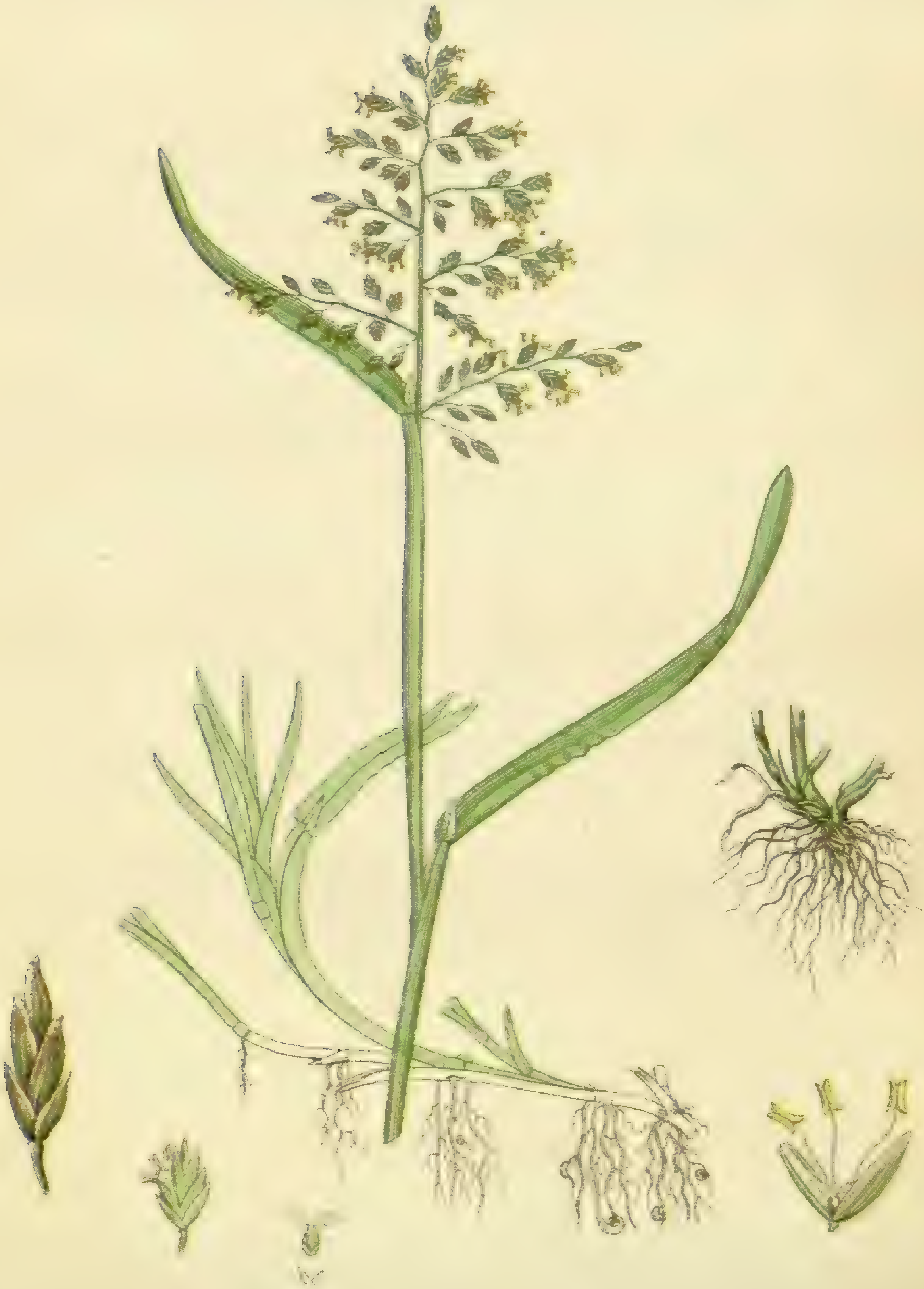






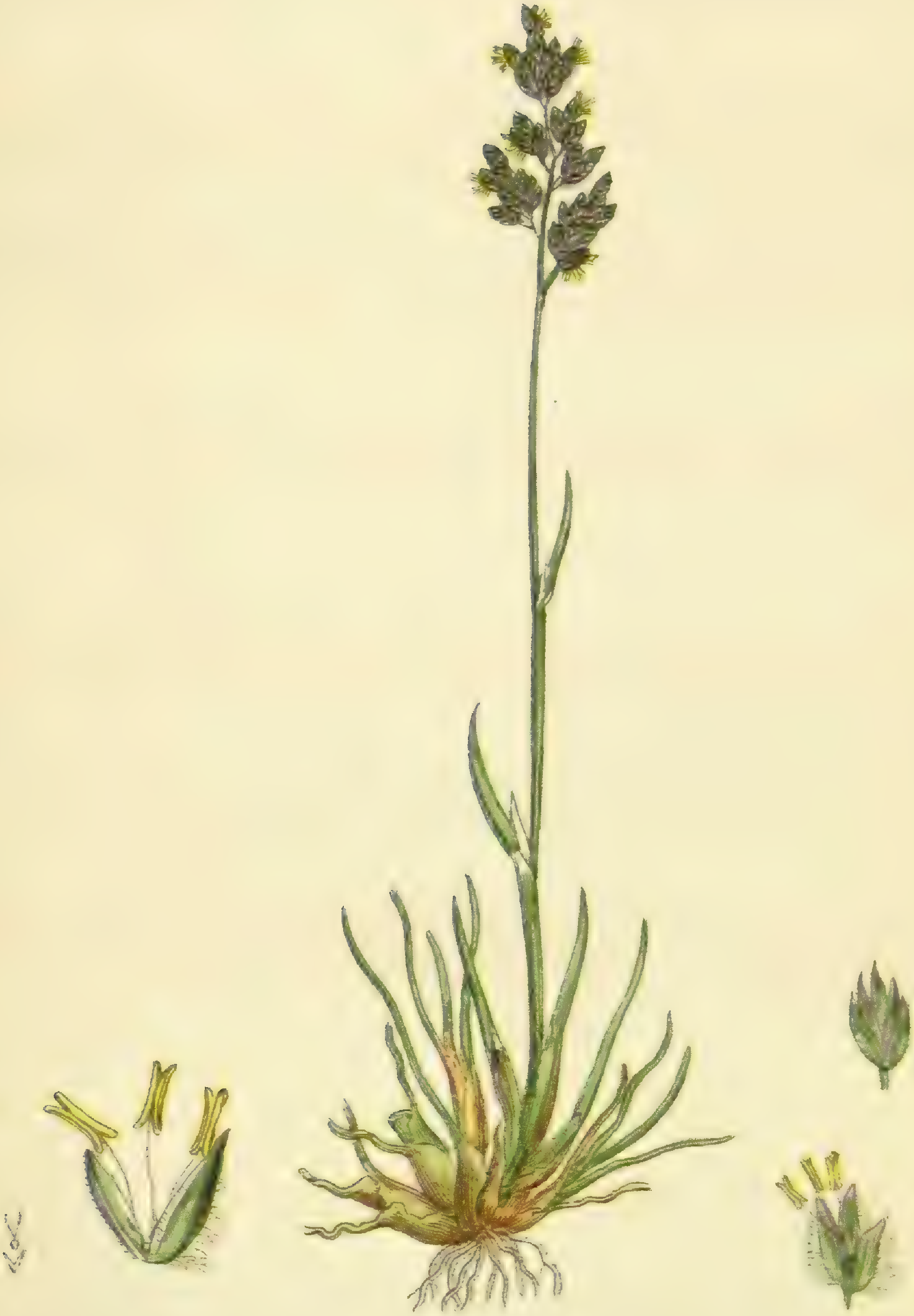
E. B. 221.

Sclerochloa loliacea. Dwarf Meadow-grass,



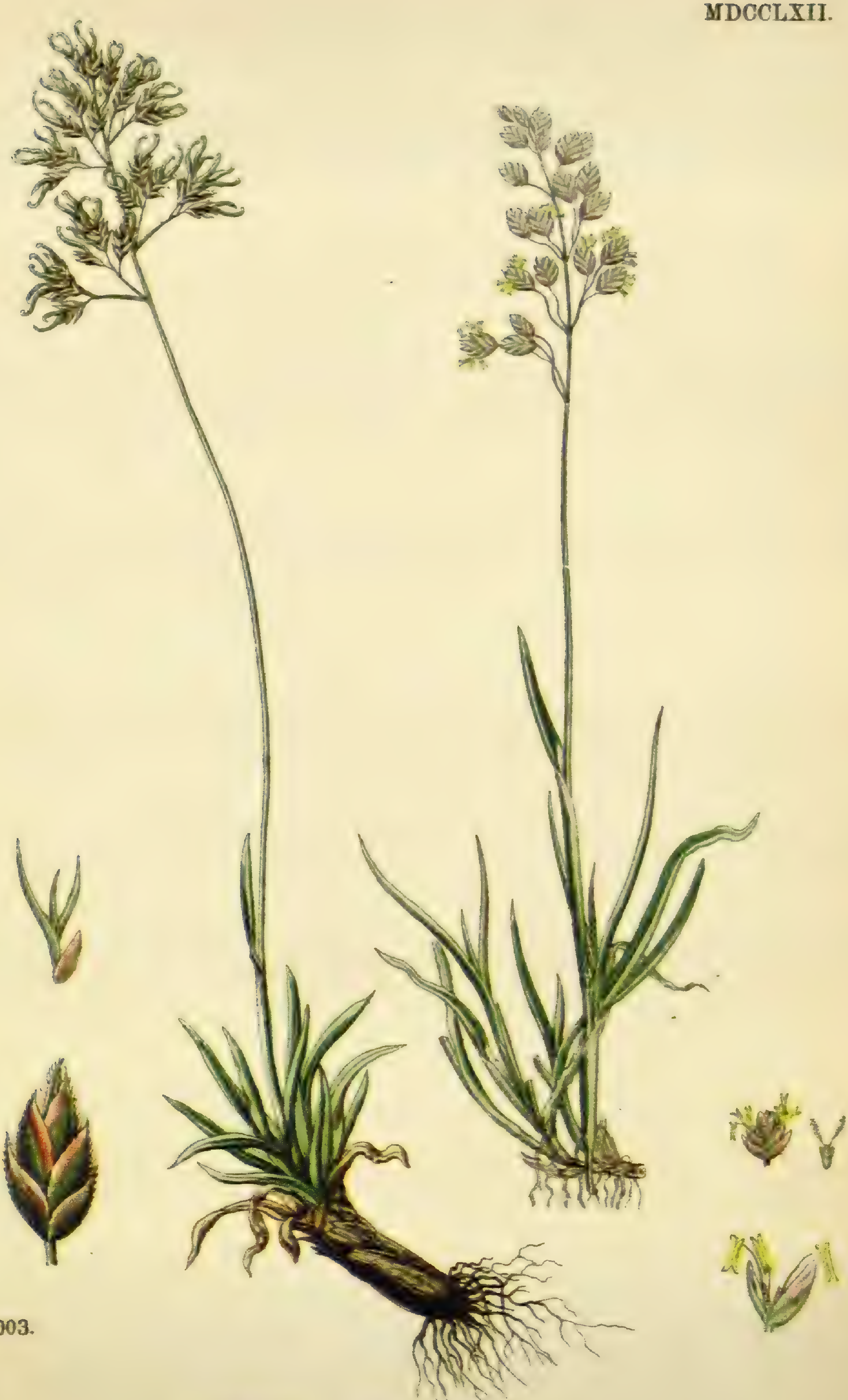
E. B. 1141.

Poa annua. Annual Meadow-grass.



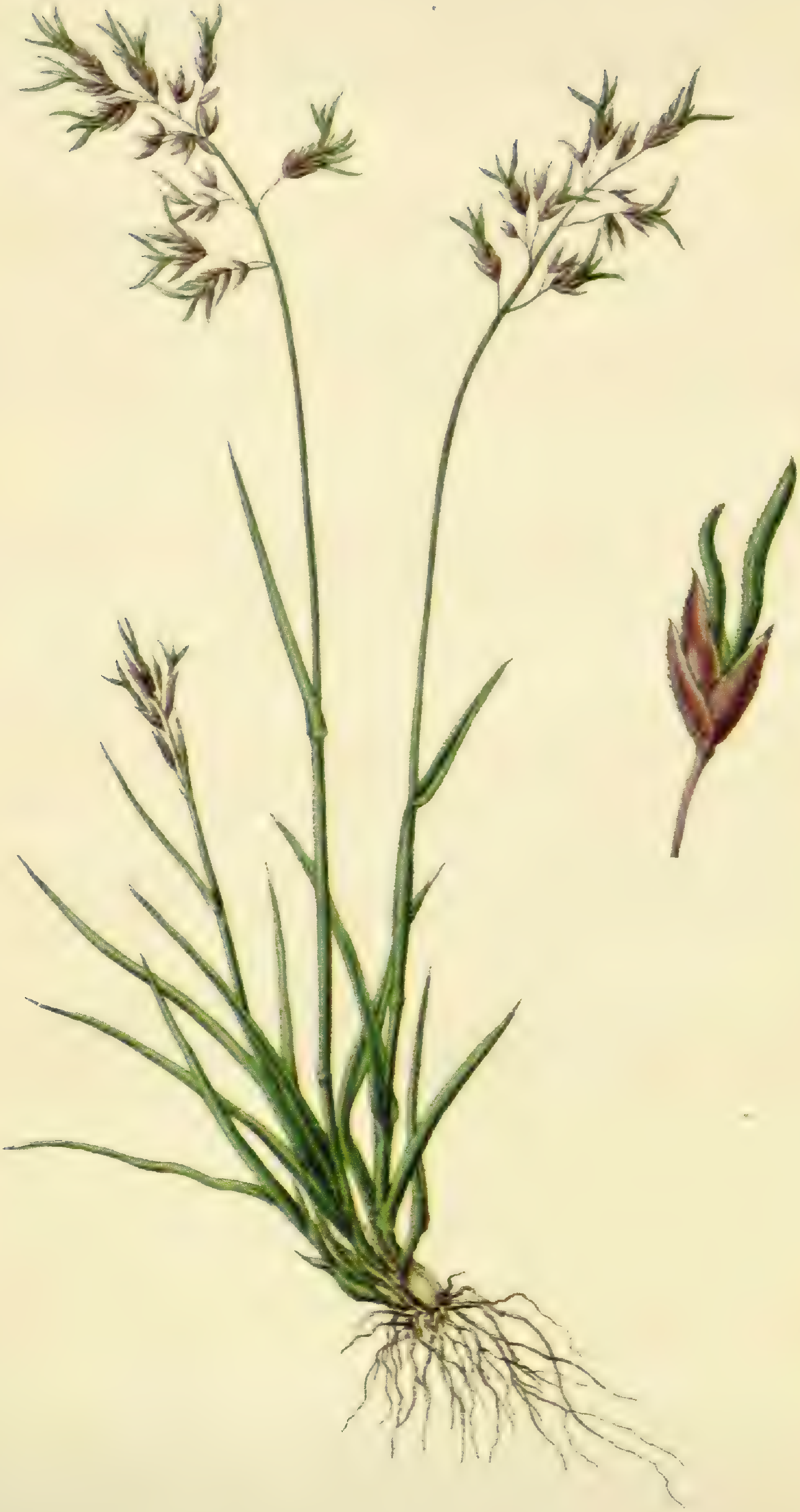
E. B. 1071.

Poa bulbosa. Bulbous Meadow-grass.

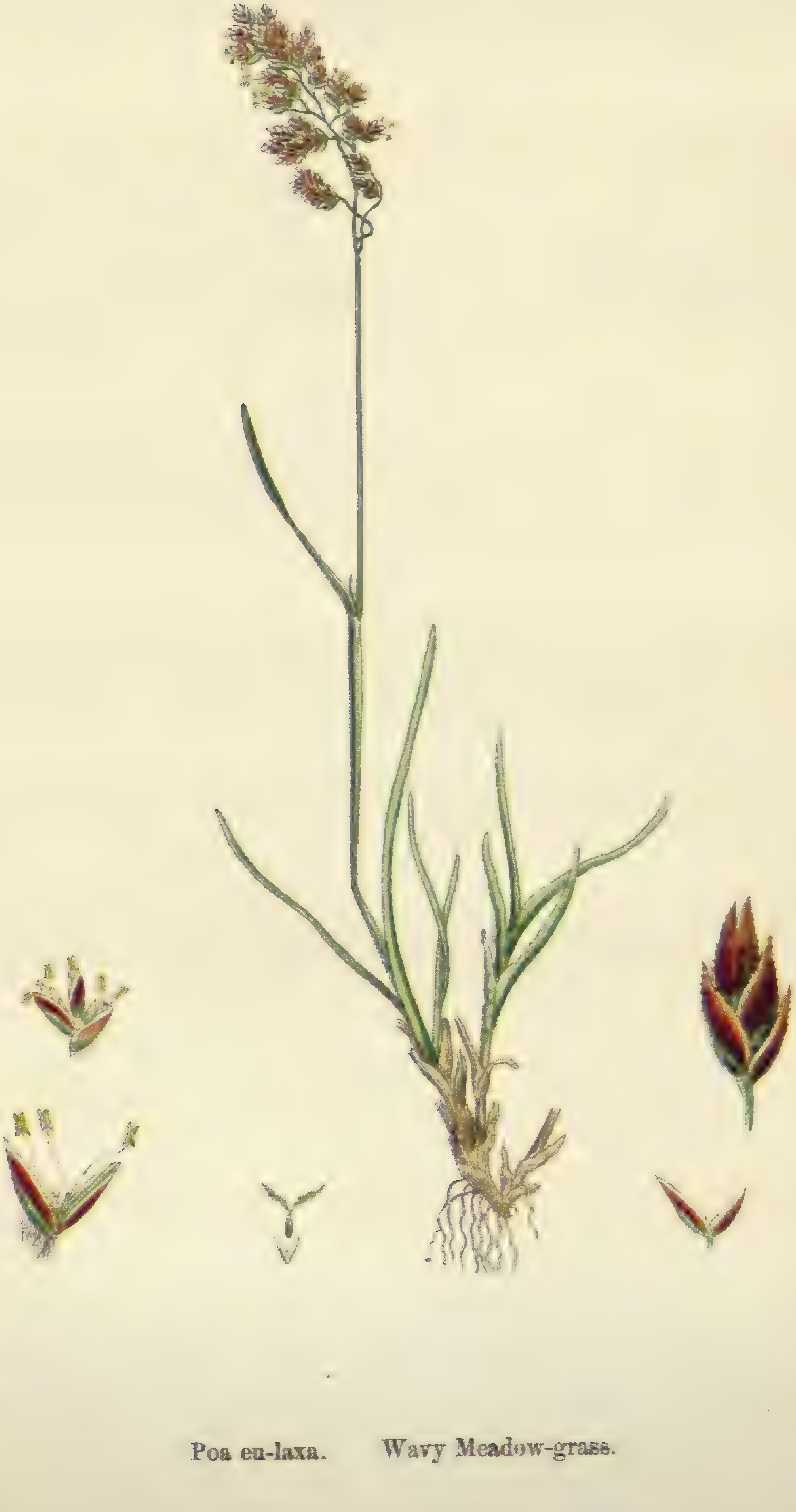


E. B. 1003.

Poa alpina. Alpine Meadow-grass.

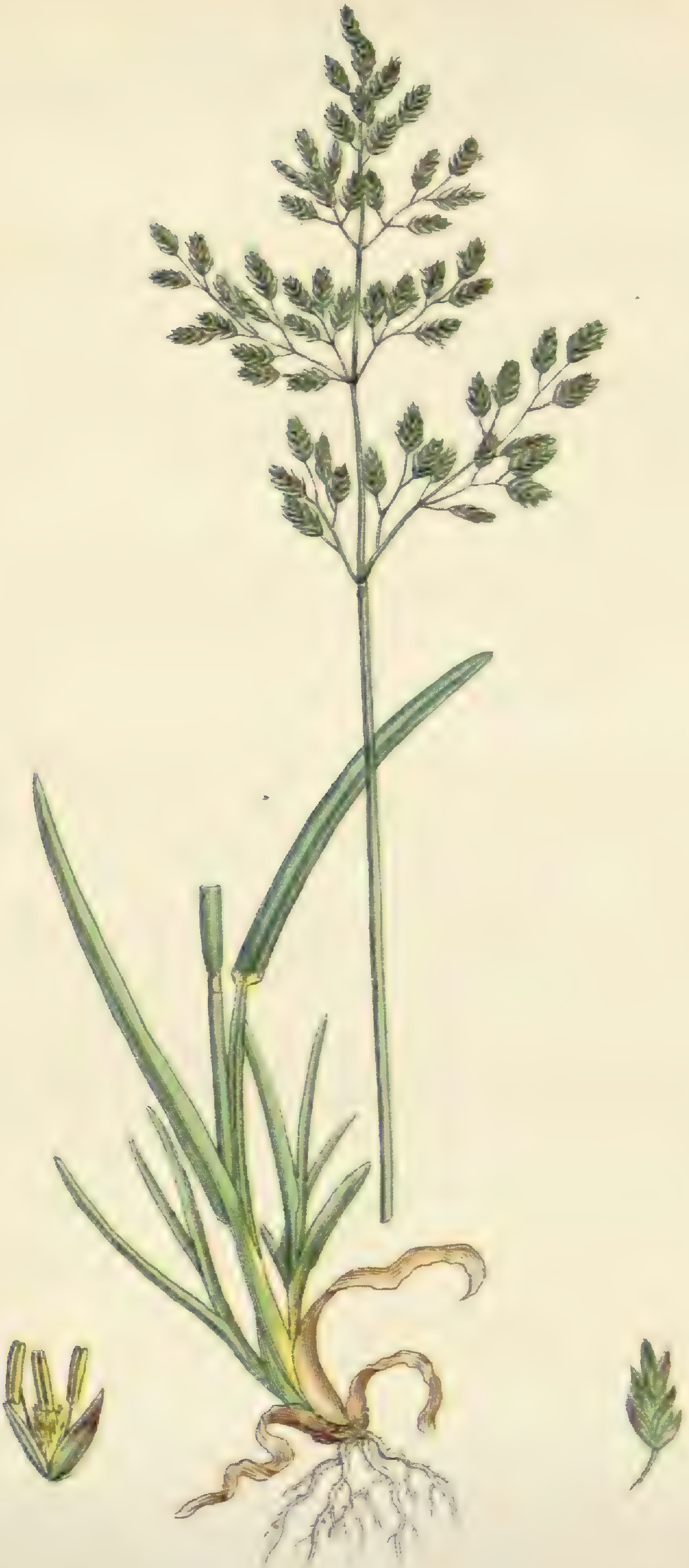


Poa stricta. Straight-stemmed Meadow-grass.



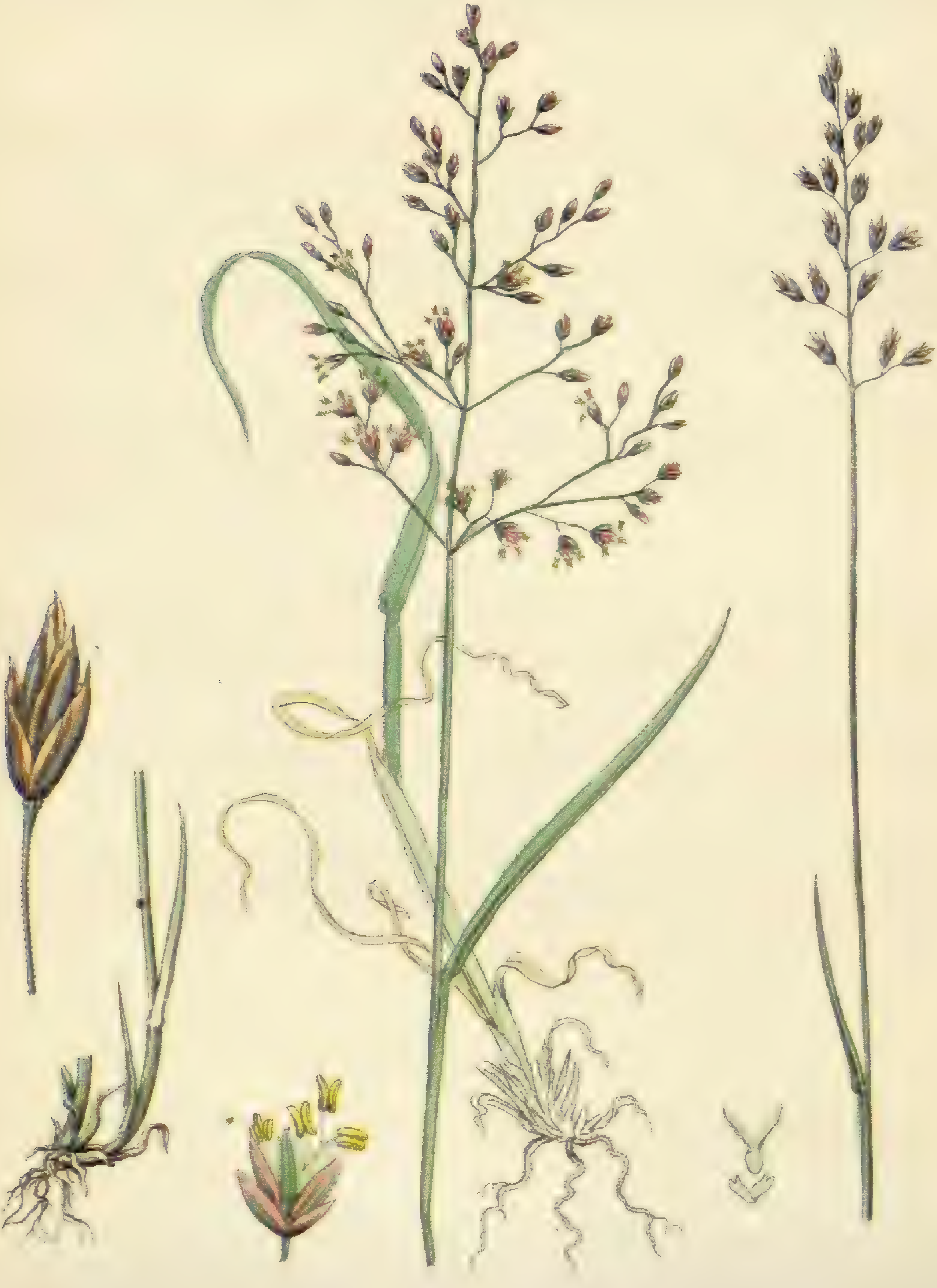
E. B. 1123.

Poa eu-laxa. Wavy Meadow-grass.



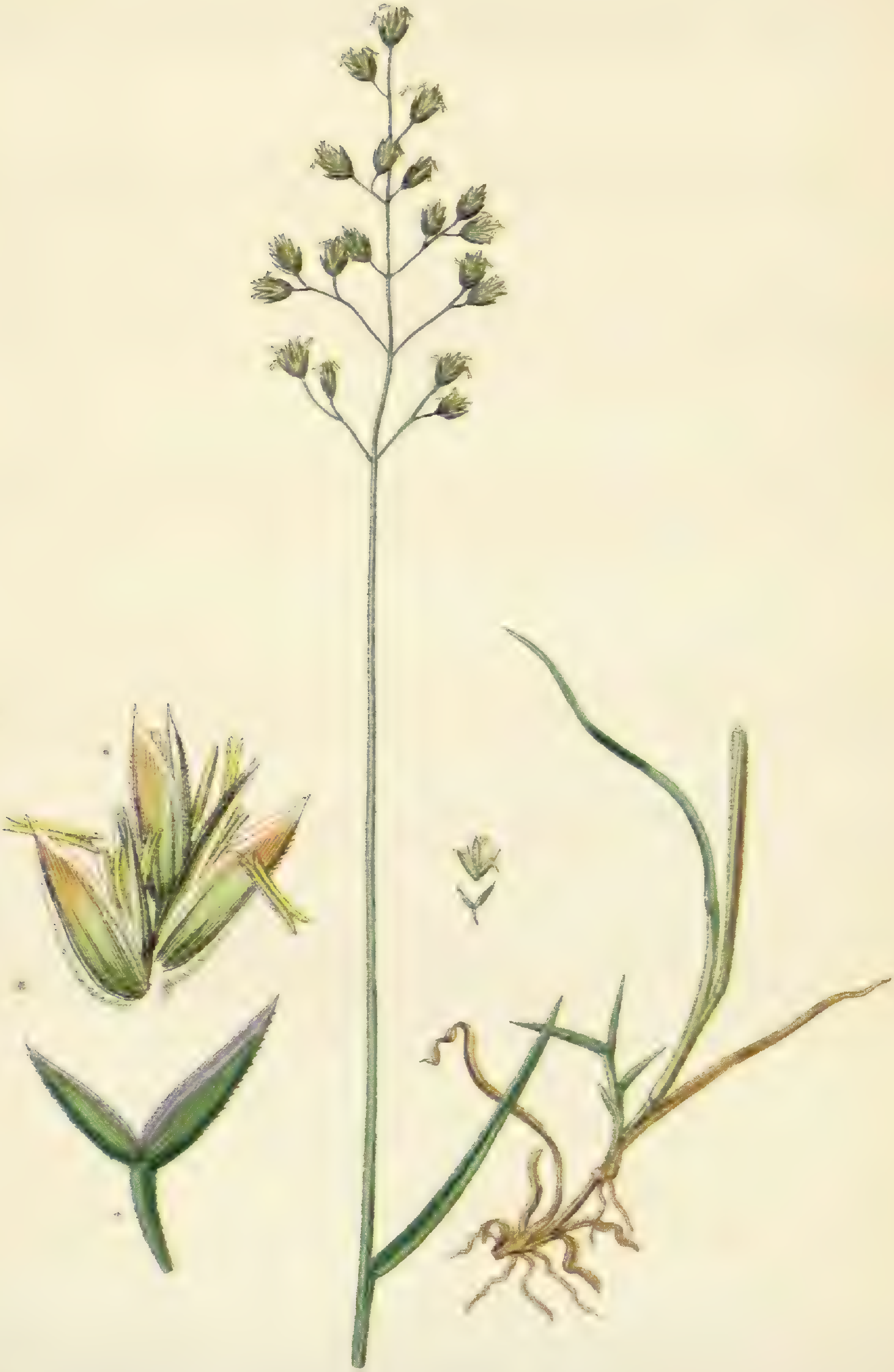
E. B. 1719.

Poa cæsia. Cæsious Meadow-grass.



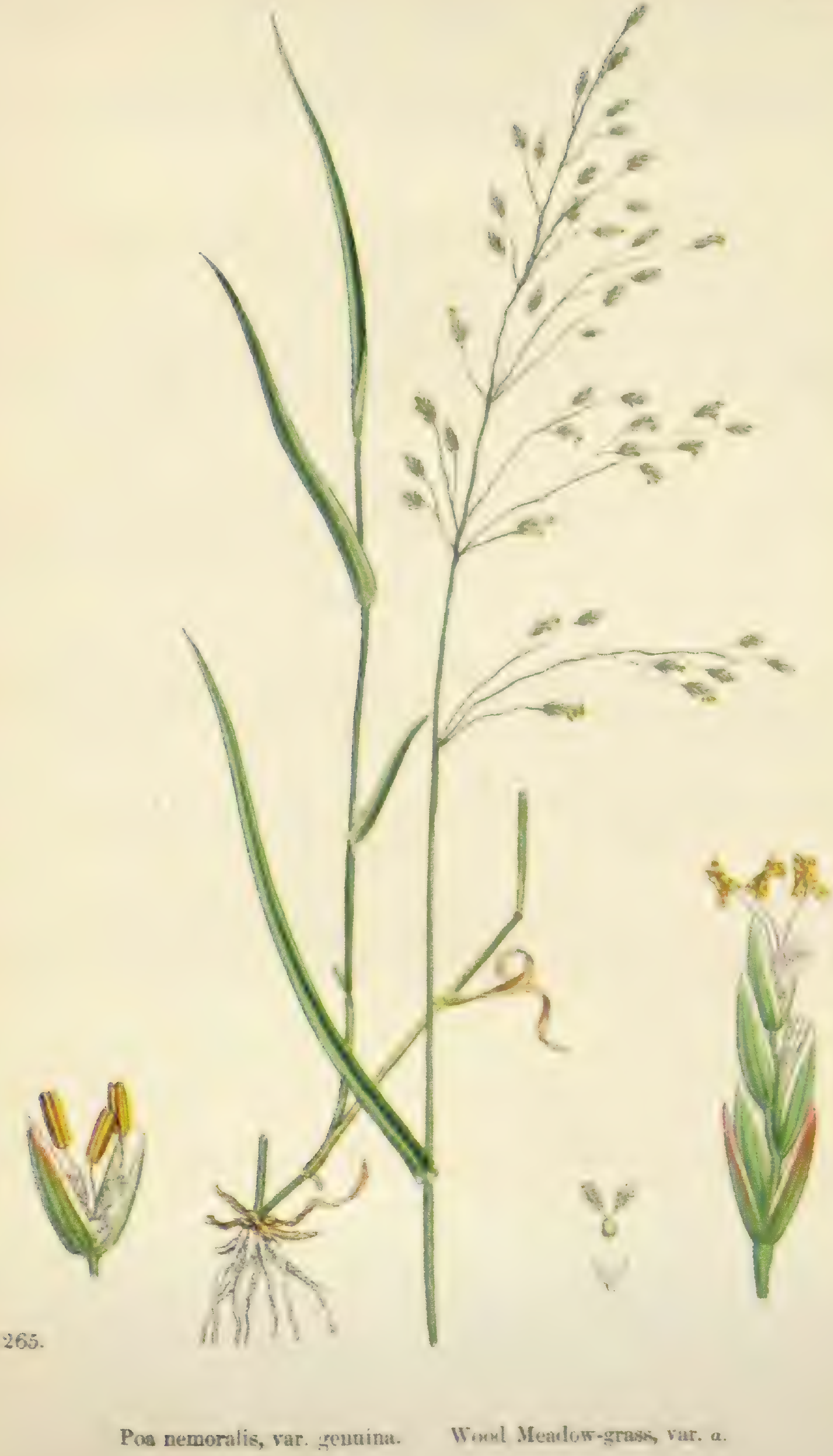
E. B. 1720.

Poa dissitiflora. **Glaucous Meadow-grass.**



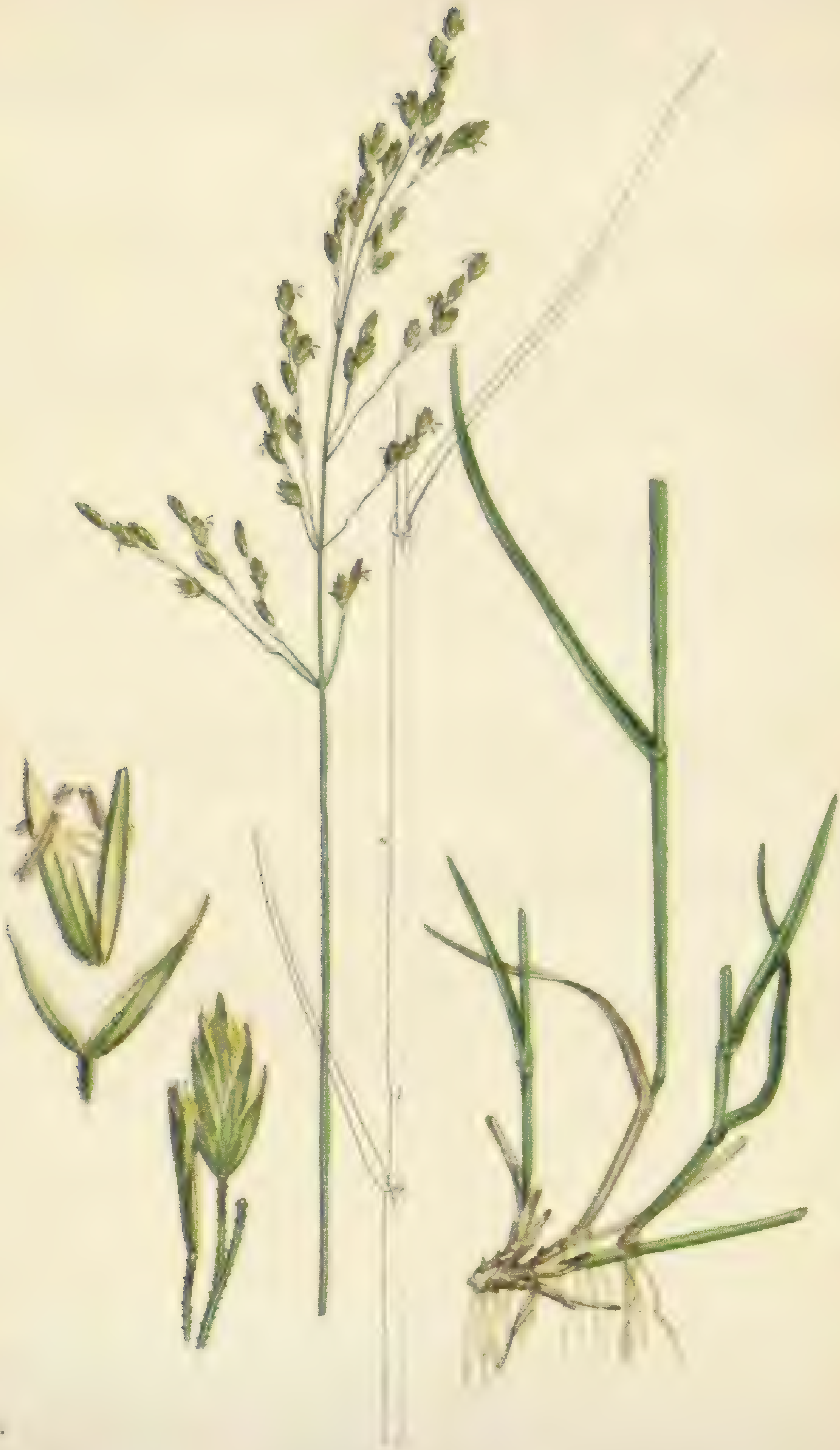
E. B. S. 2918.

Poa Balfourii. Balfour's Meadow-grass.



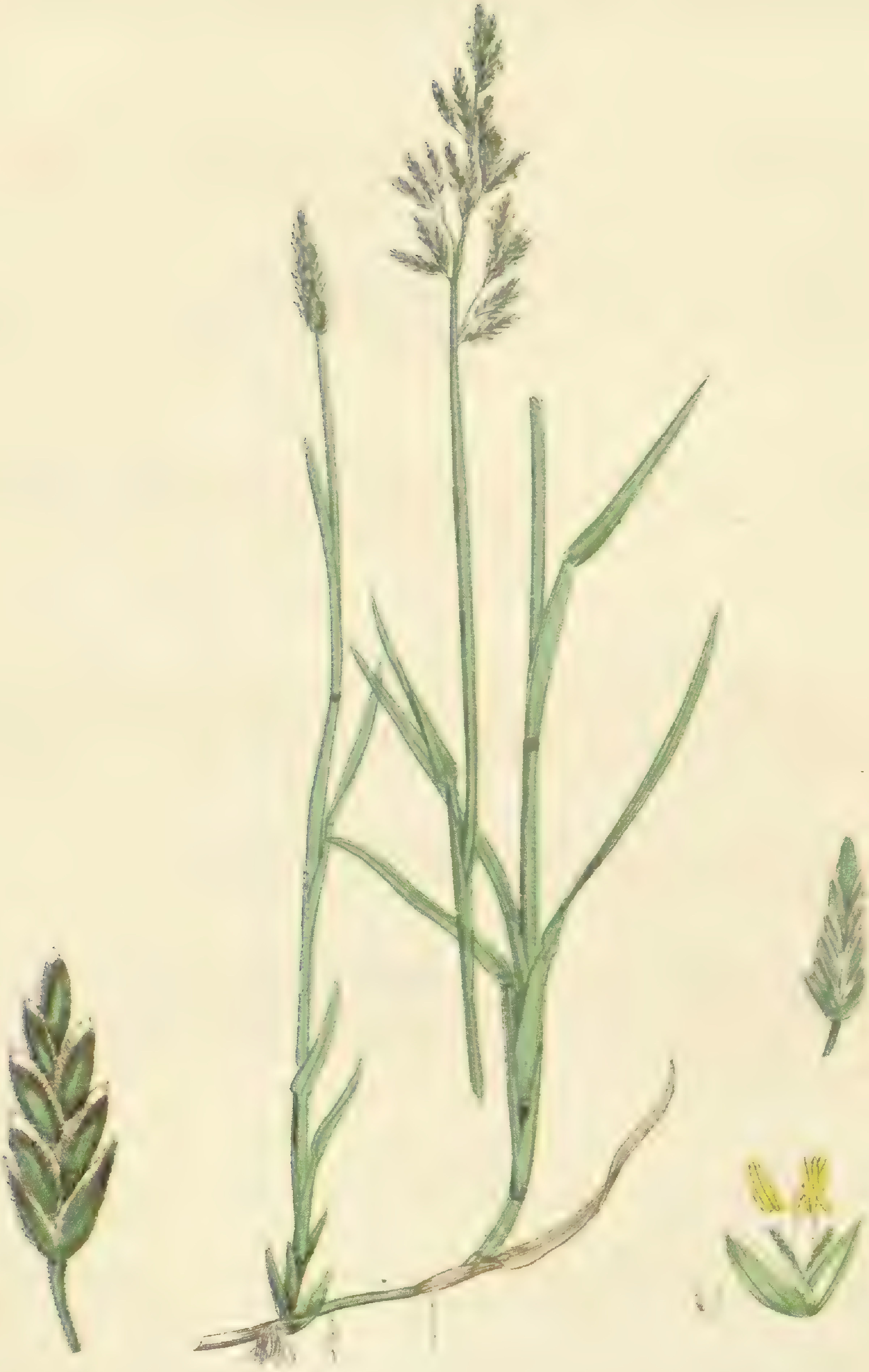
E. B. 1265.

Poa nemoralis, var. genuina. Wood Meadow-grass, var. *a.*



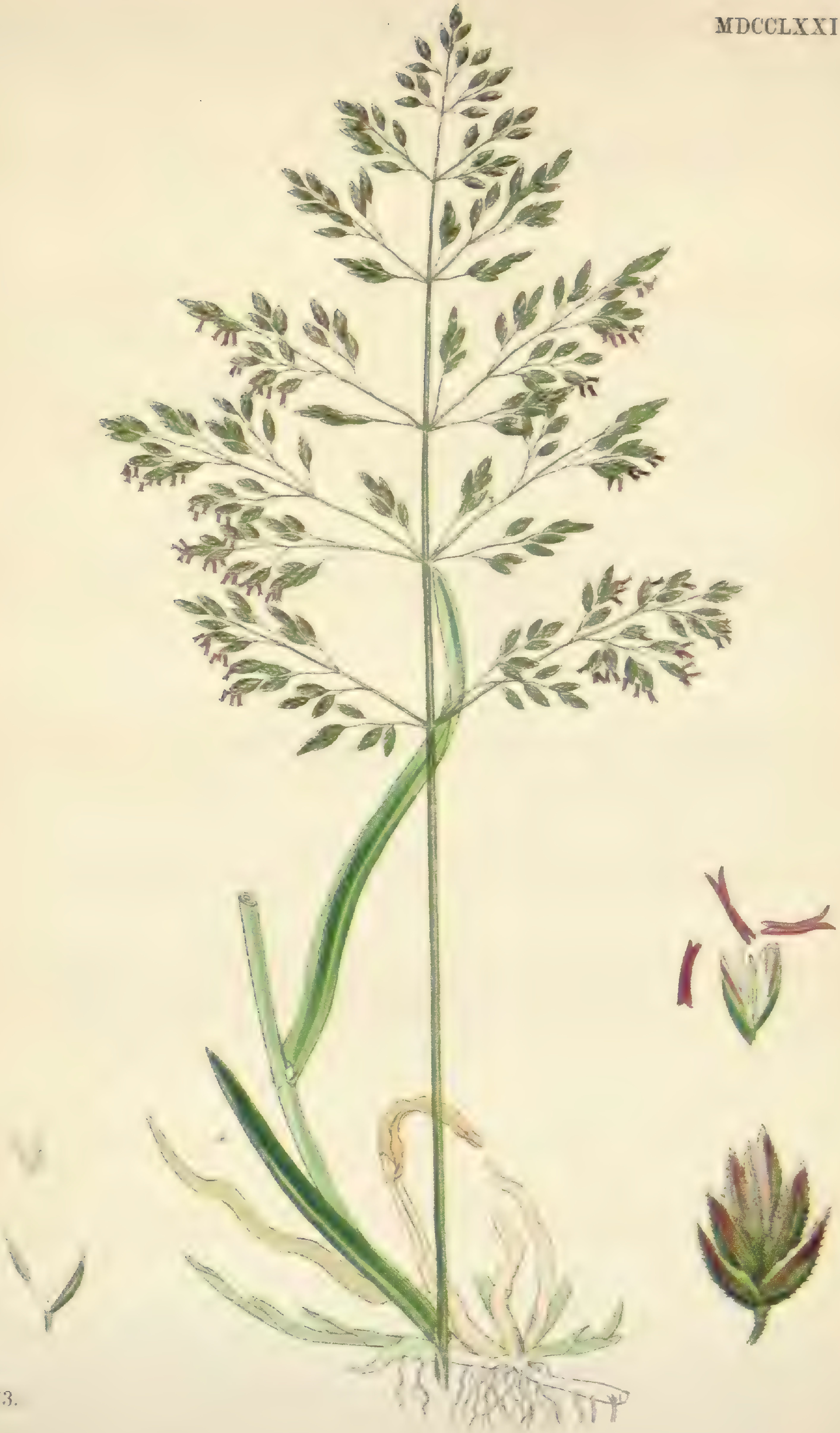
E. B. S. 2916.

Poa nemoralis, var. Parnellii.   Wood Meadow-grass, var. ε.



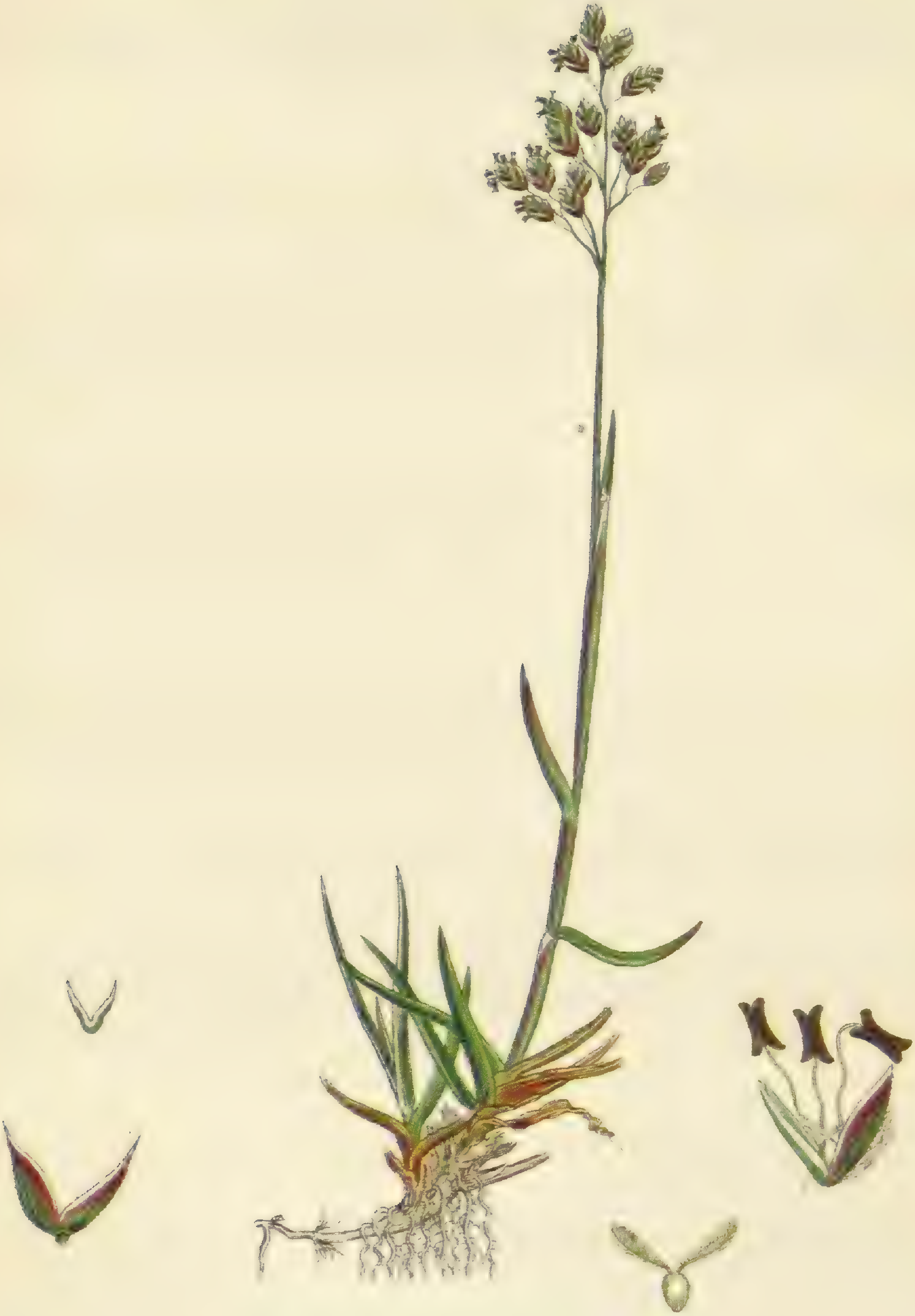
E. B. 265.

Poa compressa. Flat-stemmed Meadow-grass.



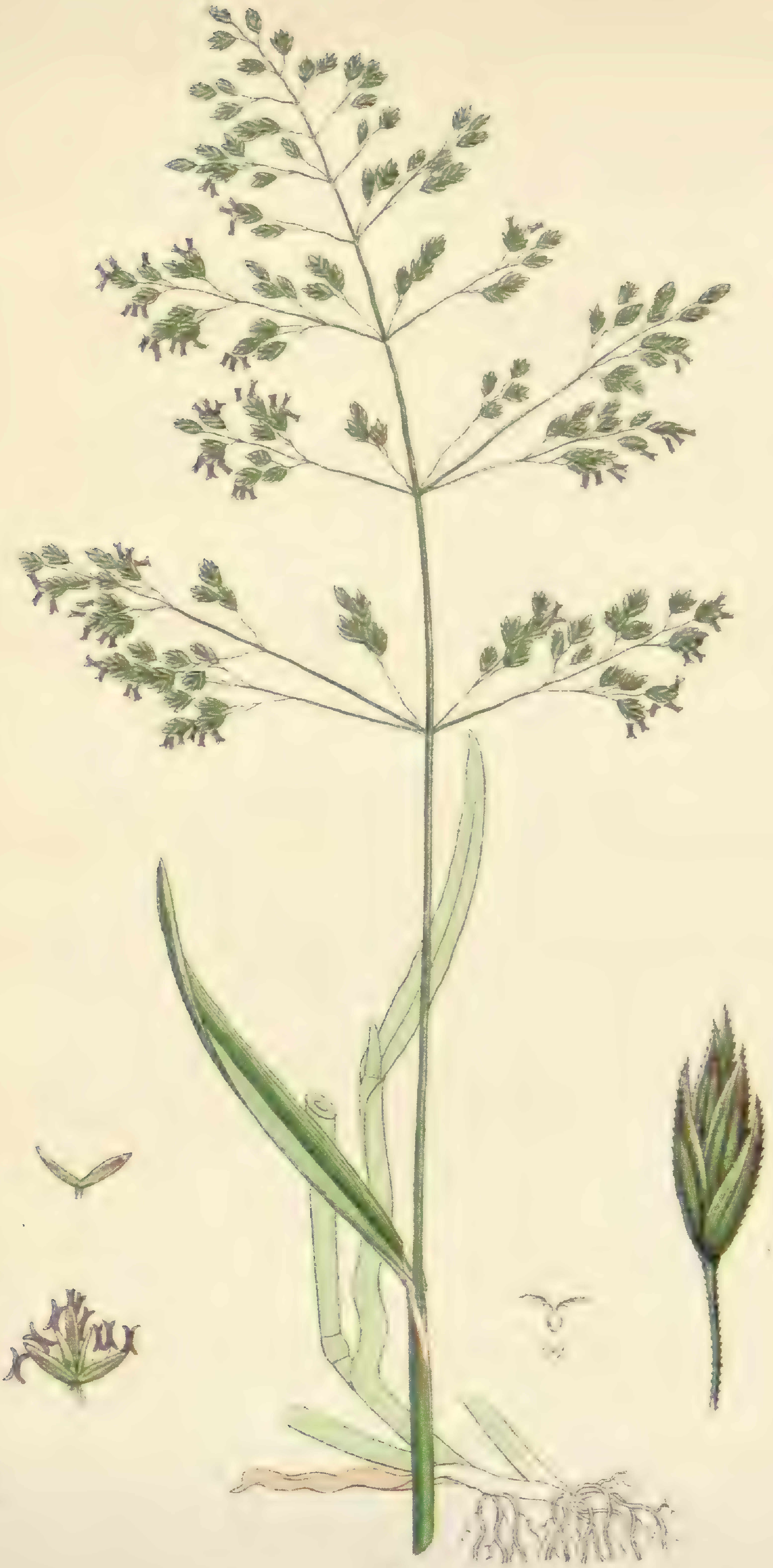
E. B. 1073.

Poa pratentis. var. genuina. Smooth Meadow-grass, var. *α*



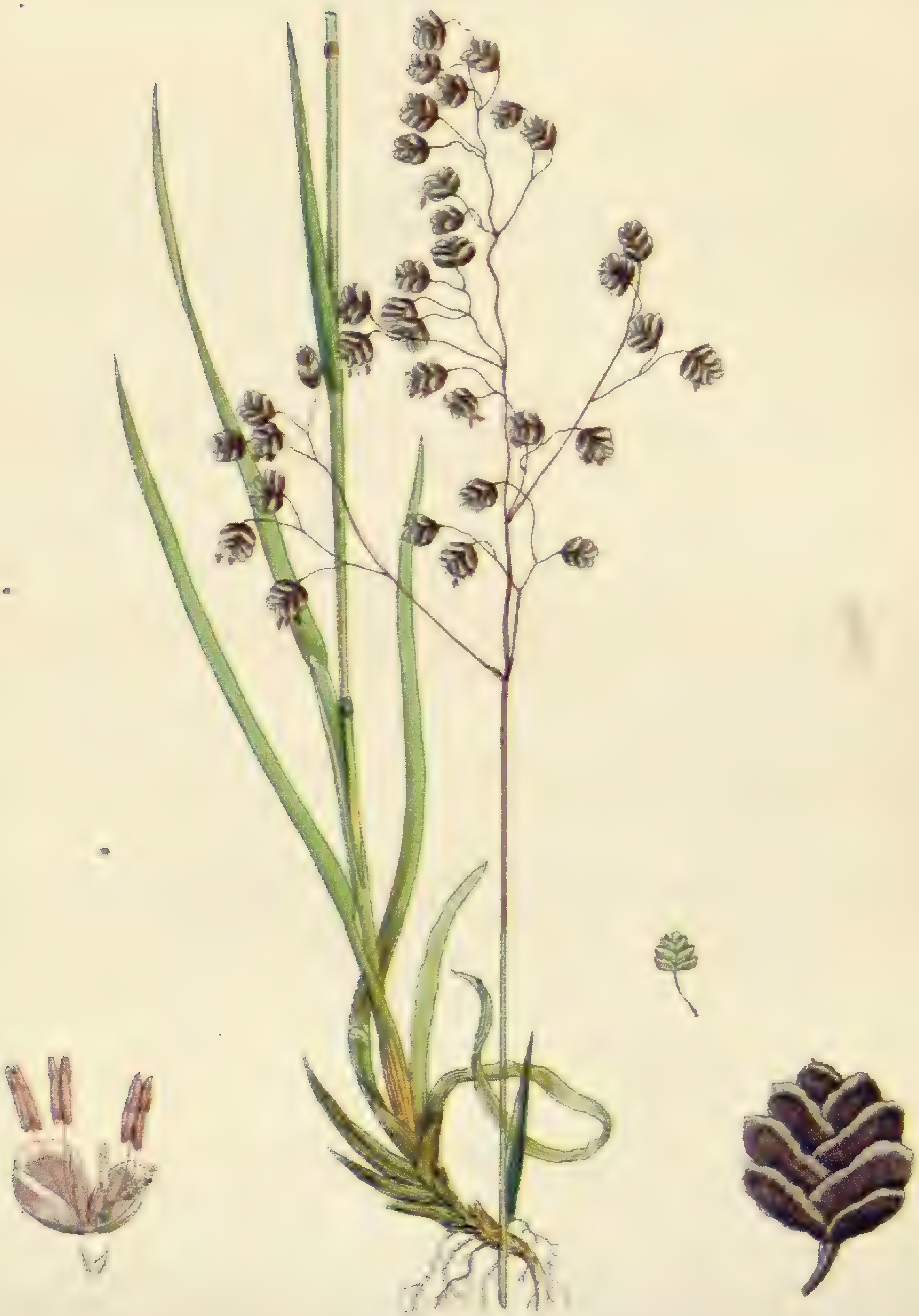
E. B. 1004.

Poa pratensis, var. subcærulea. Smooth Meadow-grass, var γ.



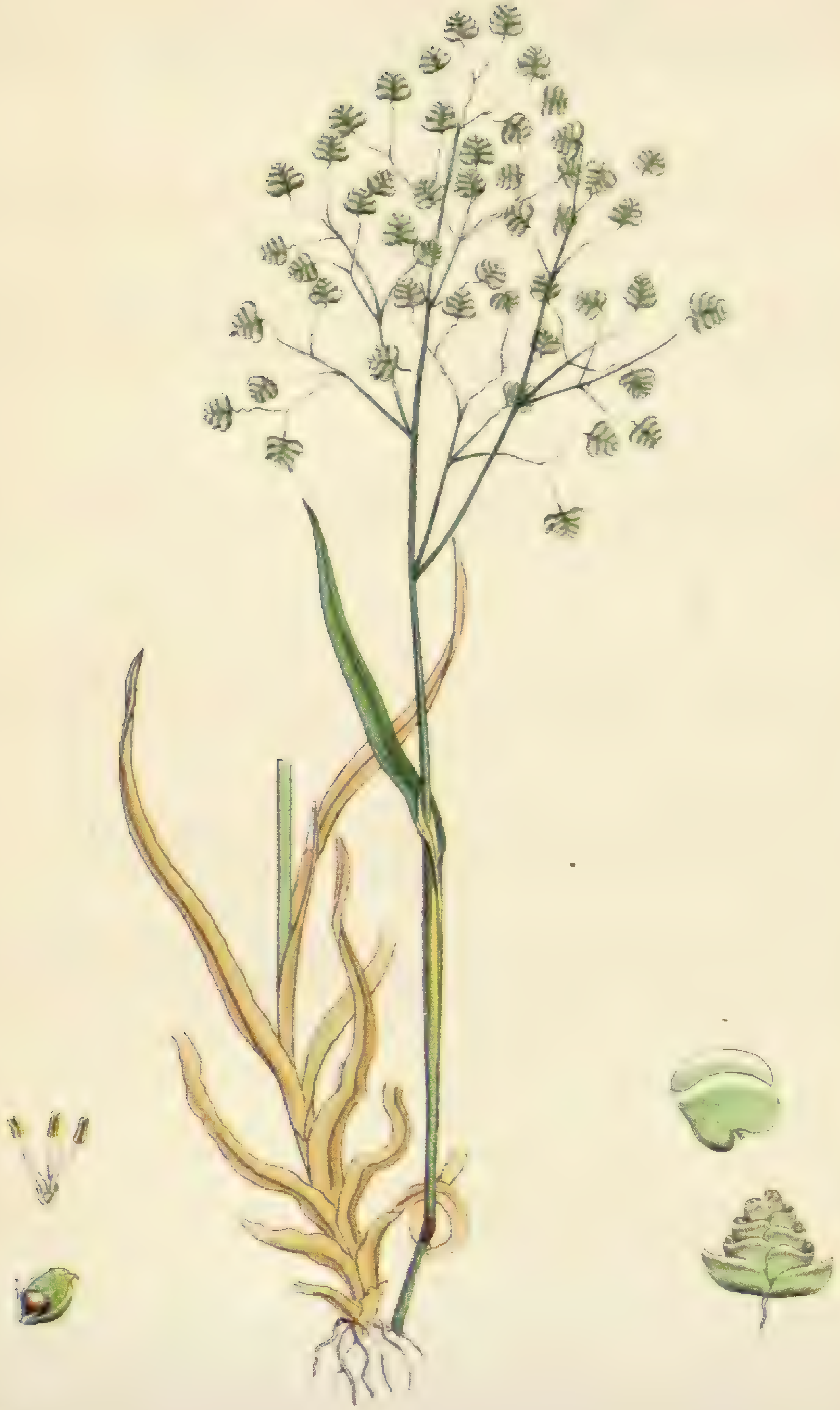
E. B. 1072.

Poa trivialis. **Rough Meadow-grass.**



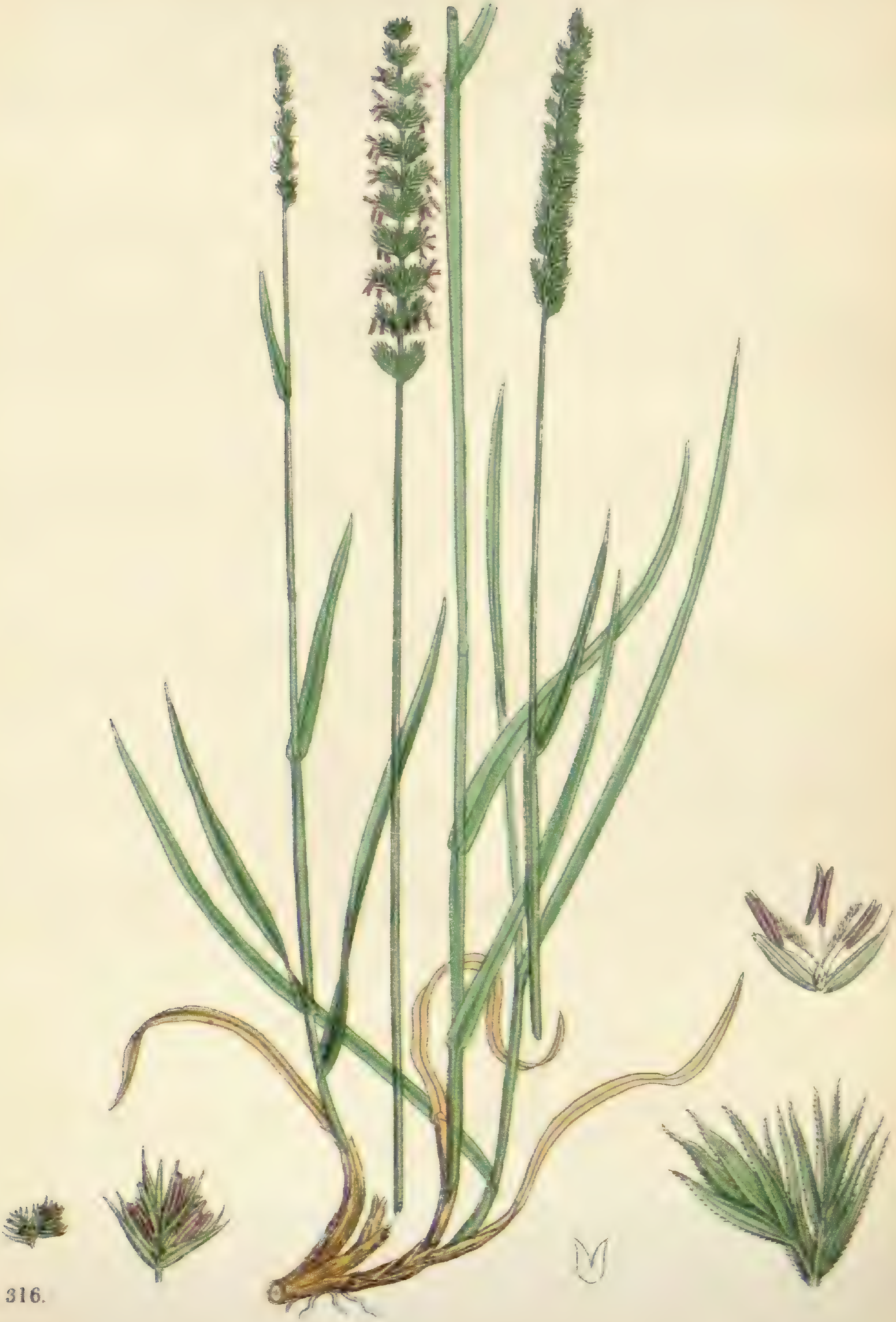
E. B. 340.

Briza media. Common Quaking-grass.



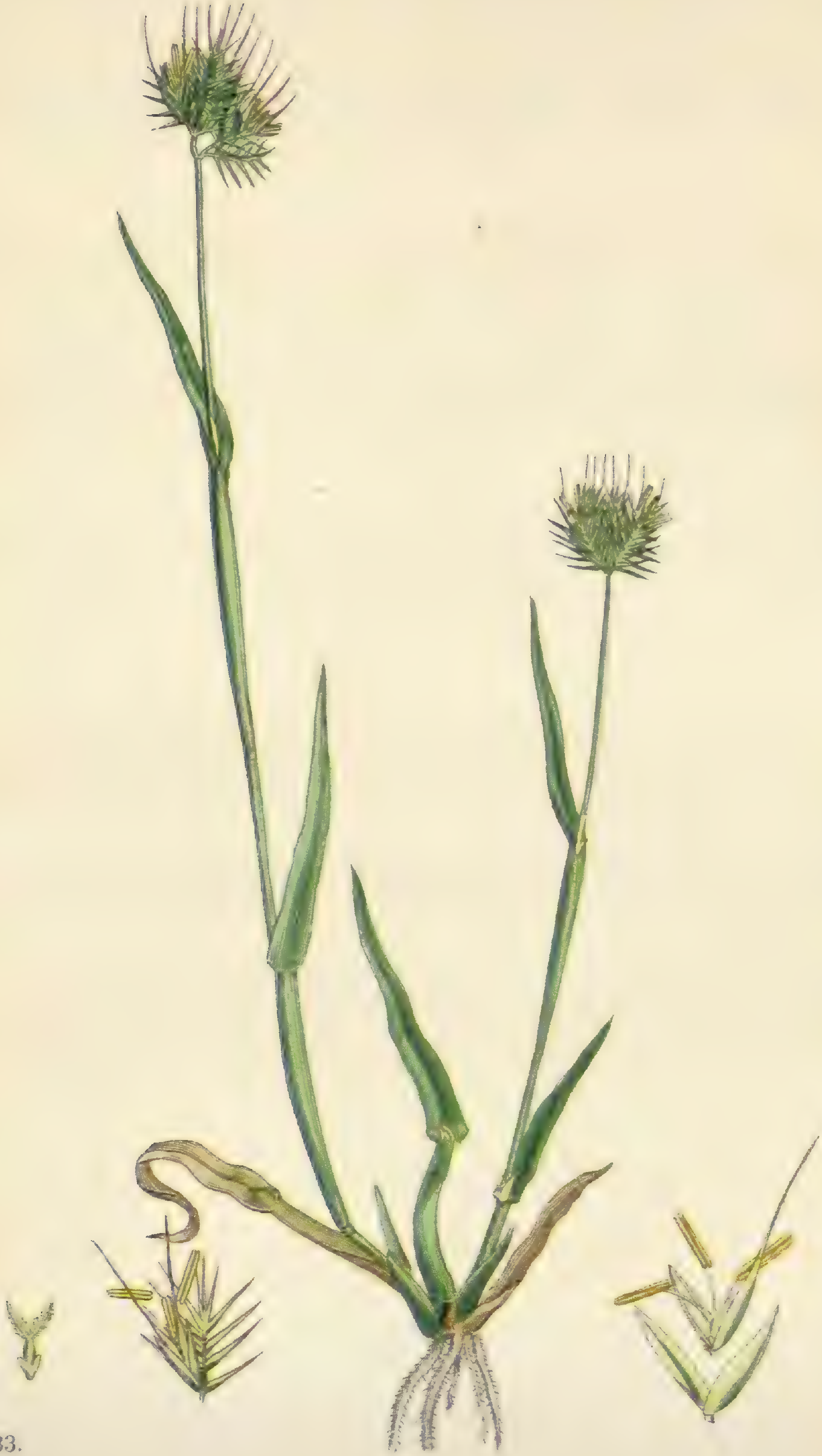
E. B. 1316.

Briza minor. **Small Quaking-grass.**



E. B. 316.

Cynosurus cristatus. Crested Dog's-tail-grass.



E. B. 1333.

Cynosurus echinatus. Rough Dog's-tail-grass.

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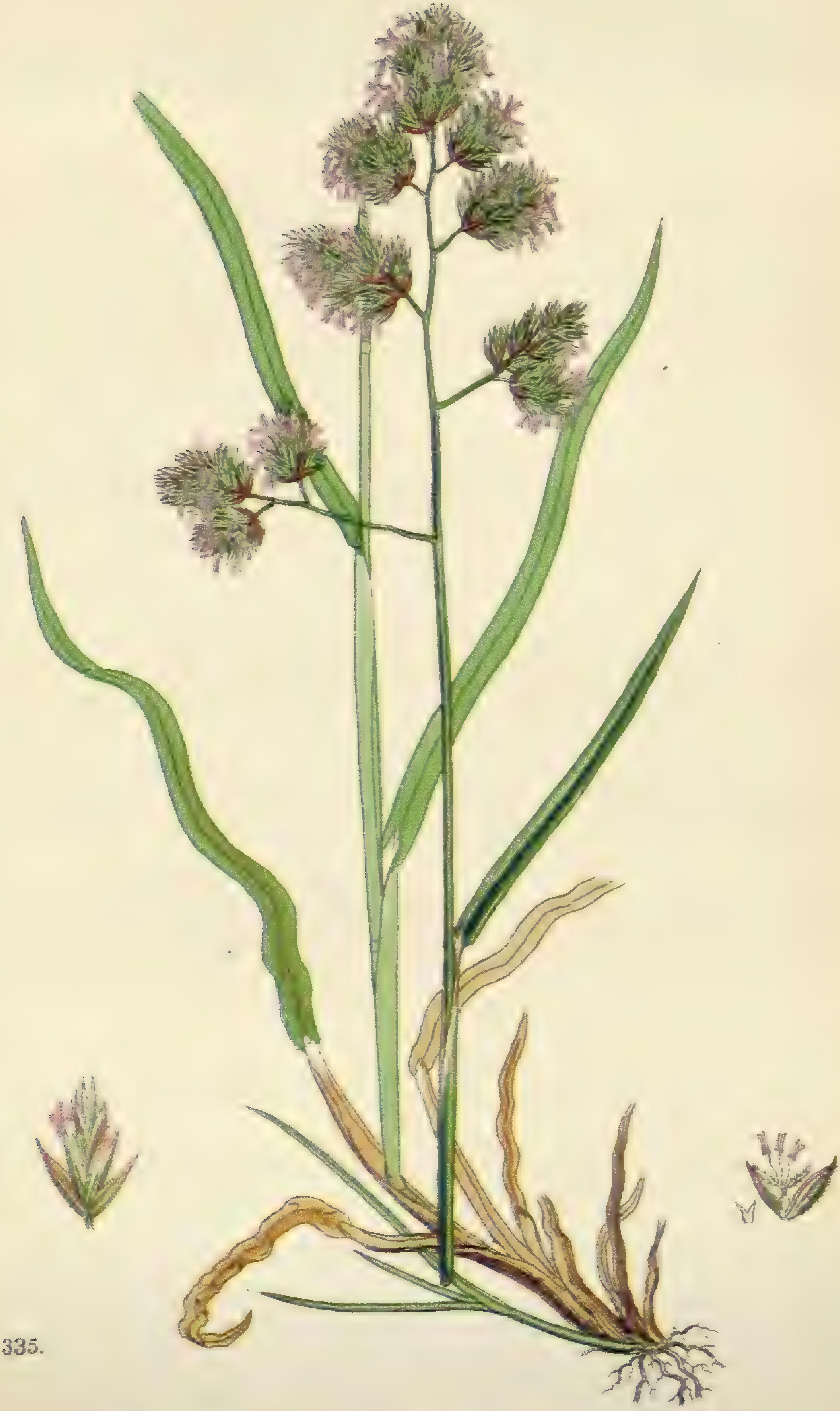
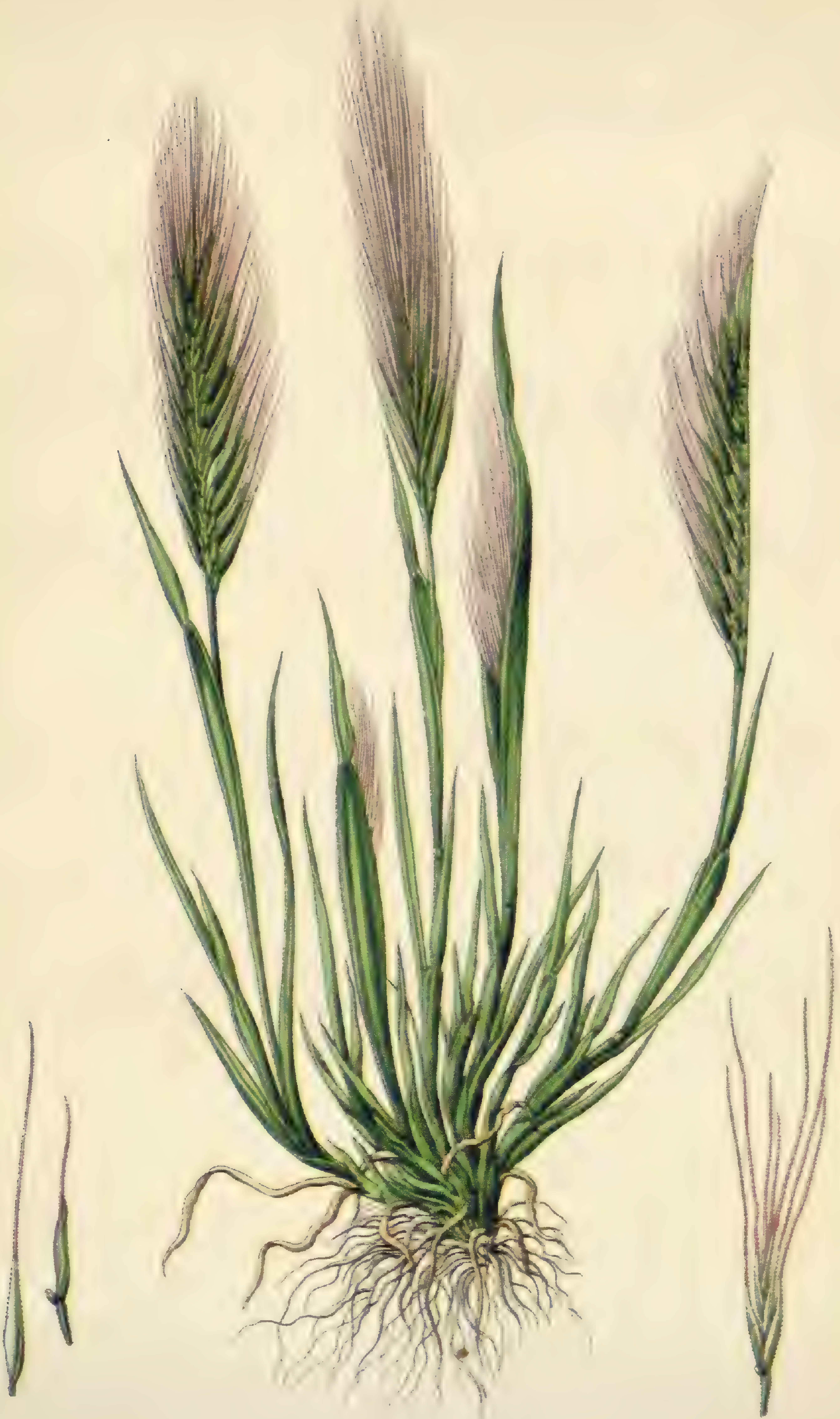
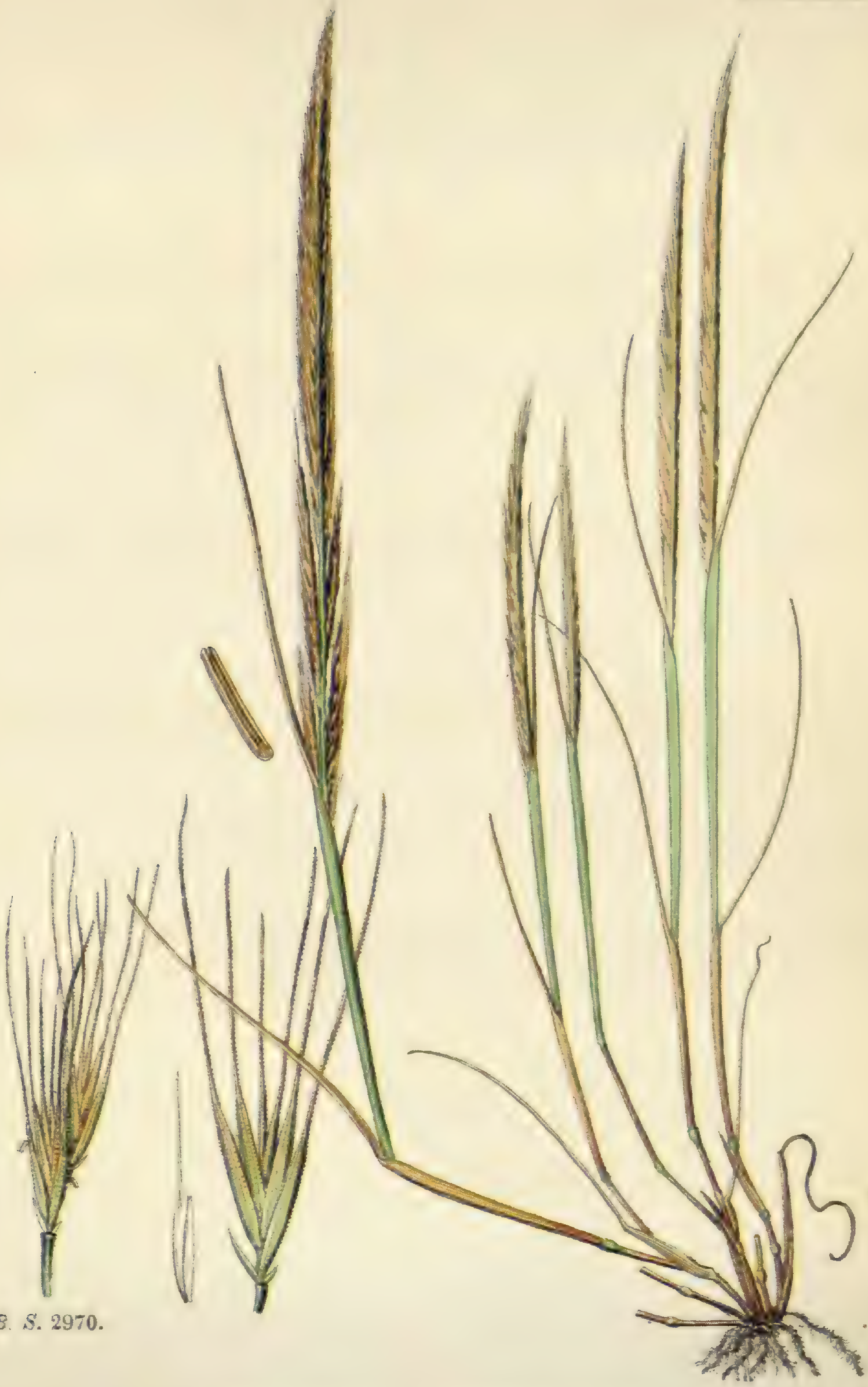


E. B. 335.

Dactylis glomerata. **Rough Cock's-foot-grass.**

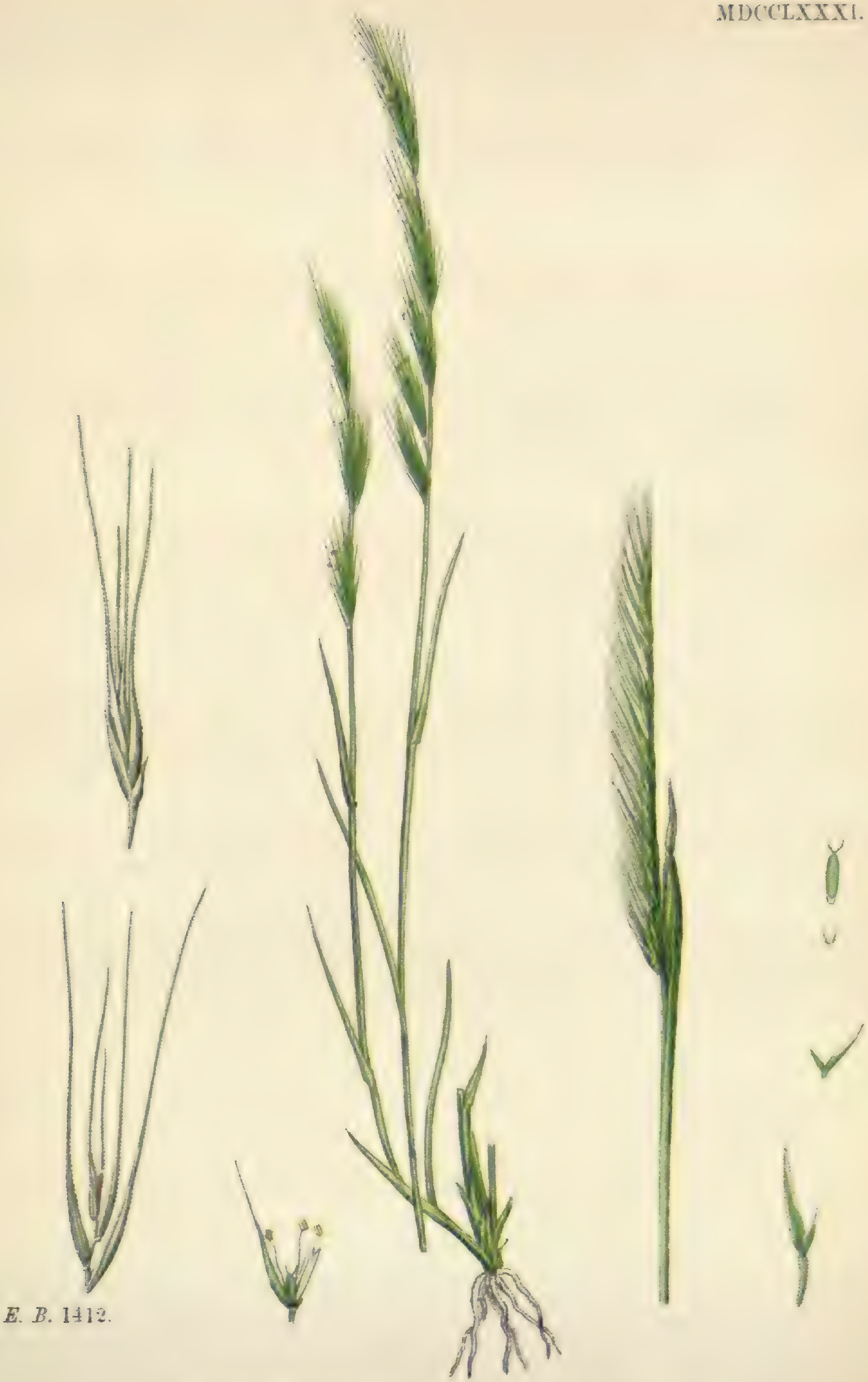


Festuca uniglumis. **Single-glumed Fescue-grass.**

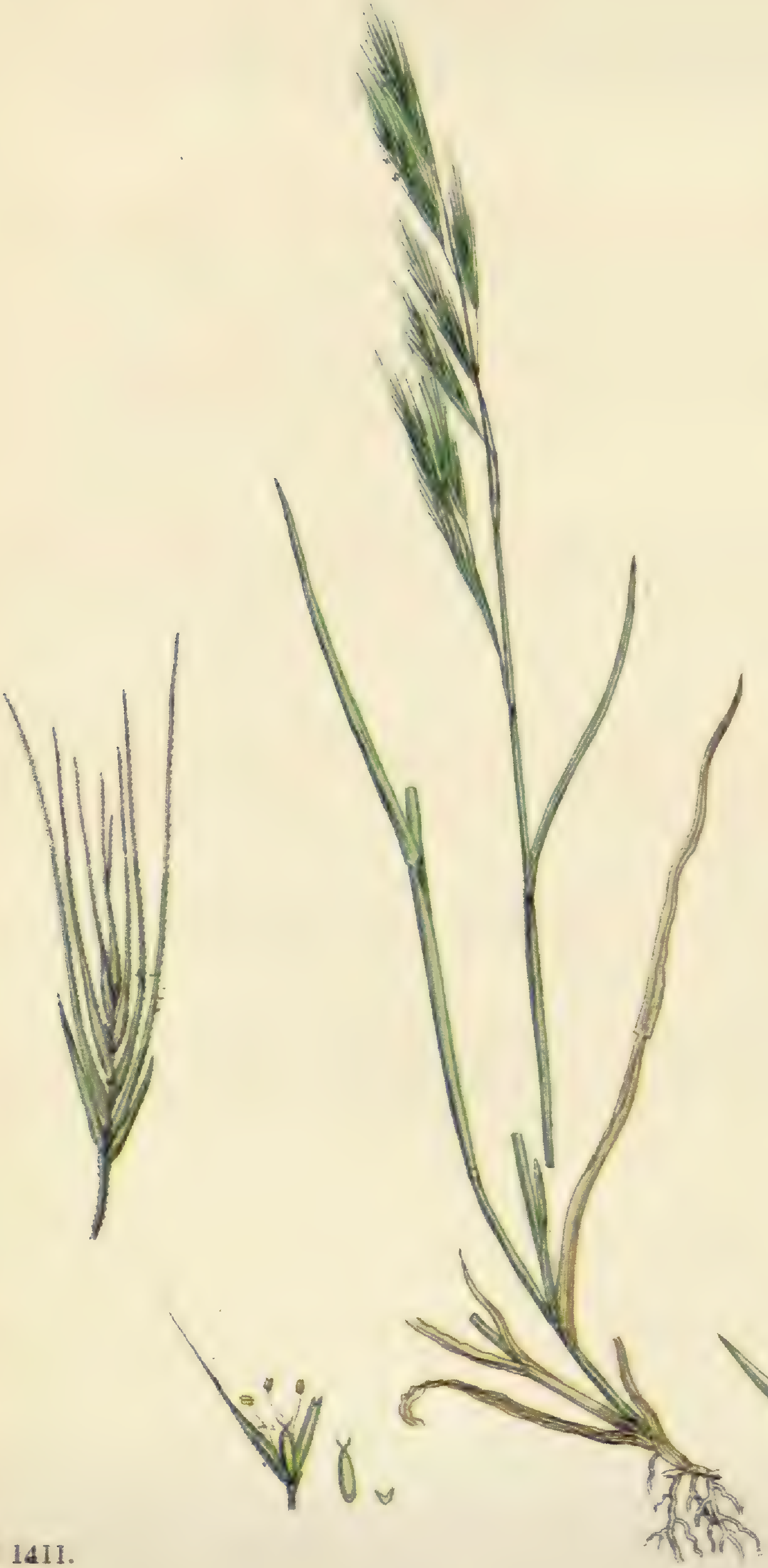


E. B. S. 2970.

Festuca ambigua.   Ambiguous Fescue-grass.

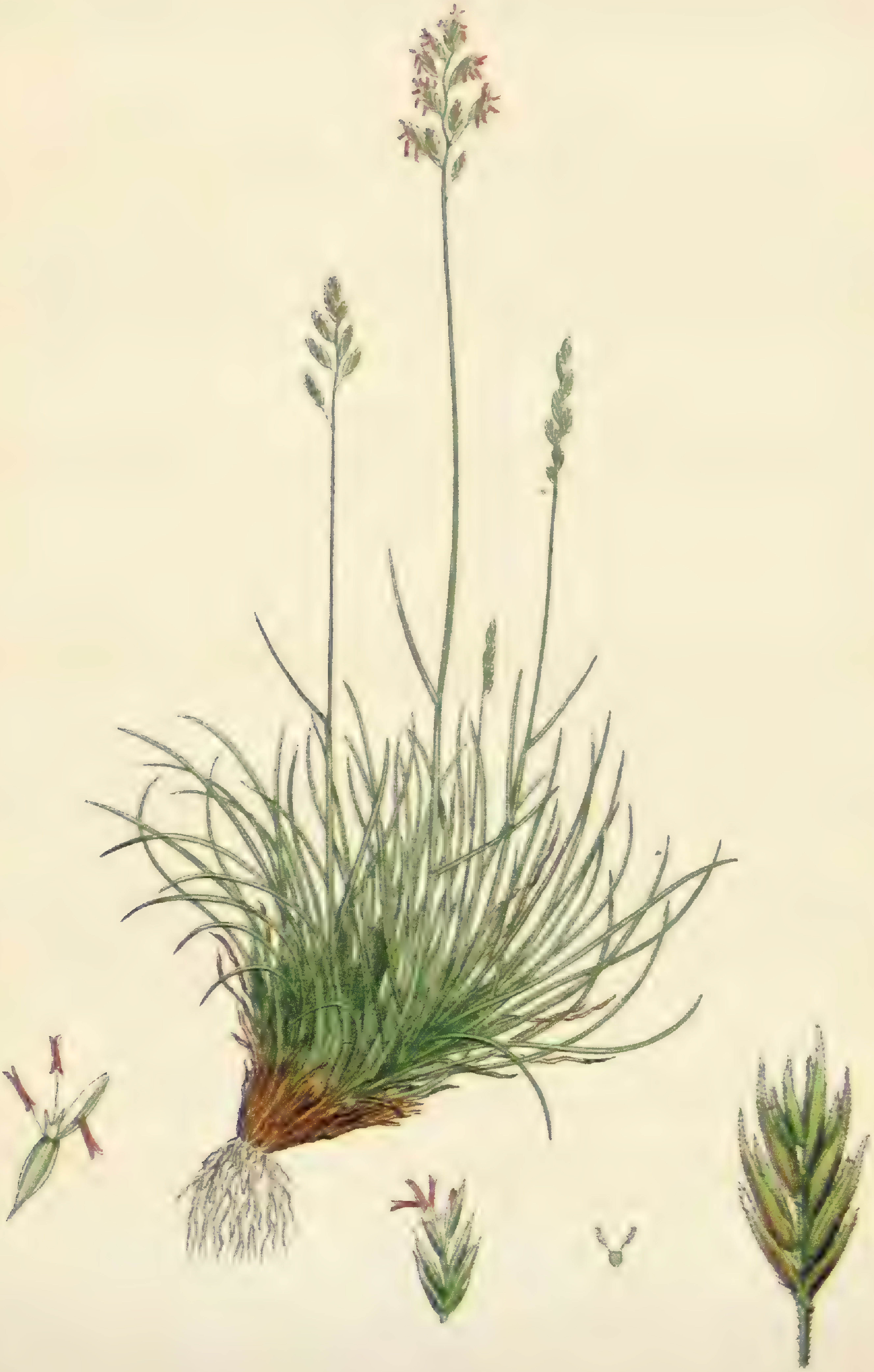


Festuca Pseudo-myuros. Mouse-tail Fescue-grass.



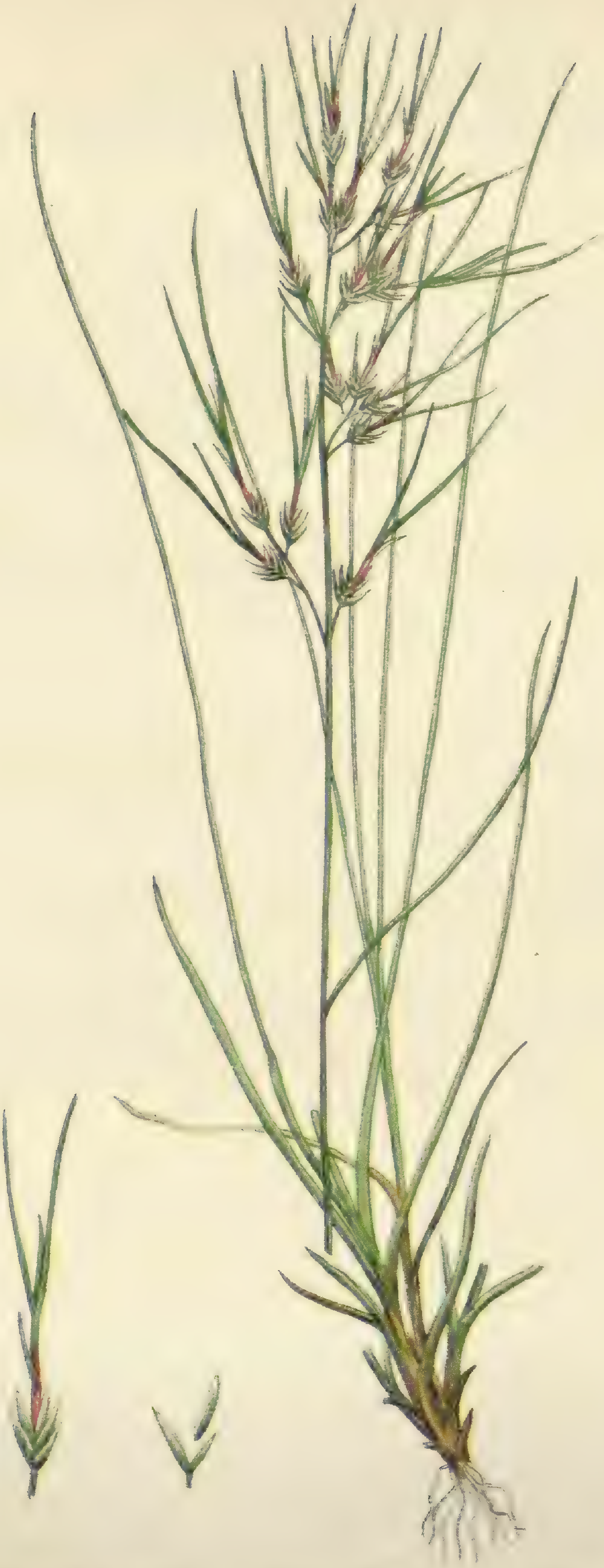
E. B. 1411.

Festuca sciuroides. Barren Fescue-grass.



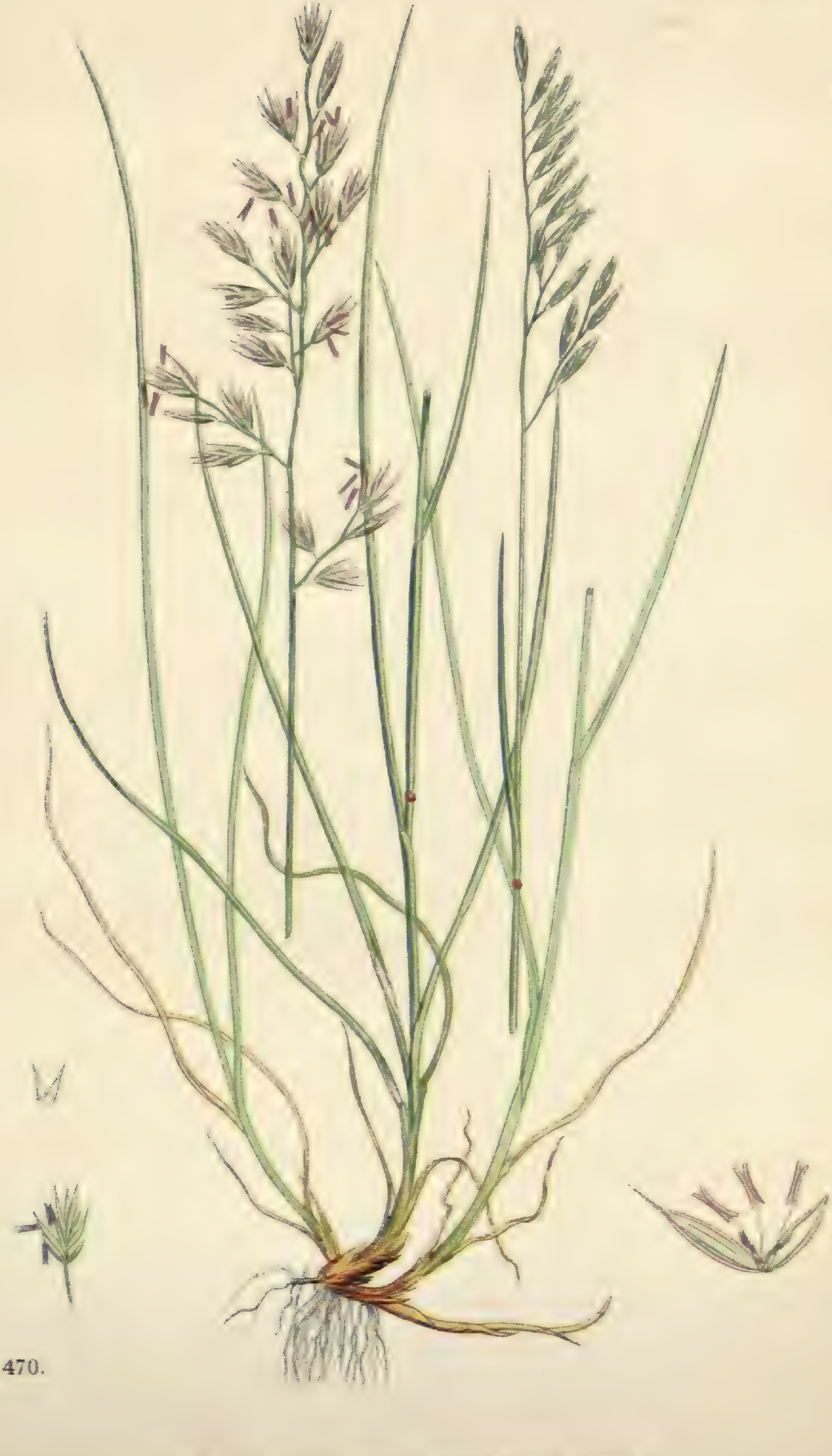
E. B. 585.

Festuca ovina, var. genuina. Sheep's Fescue-grass, var. *a*.



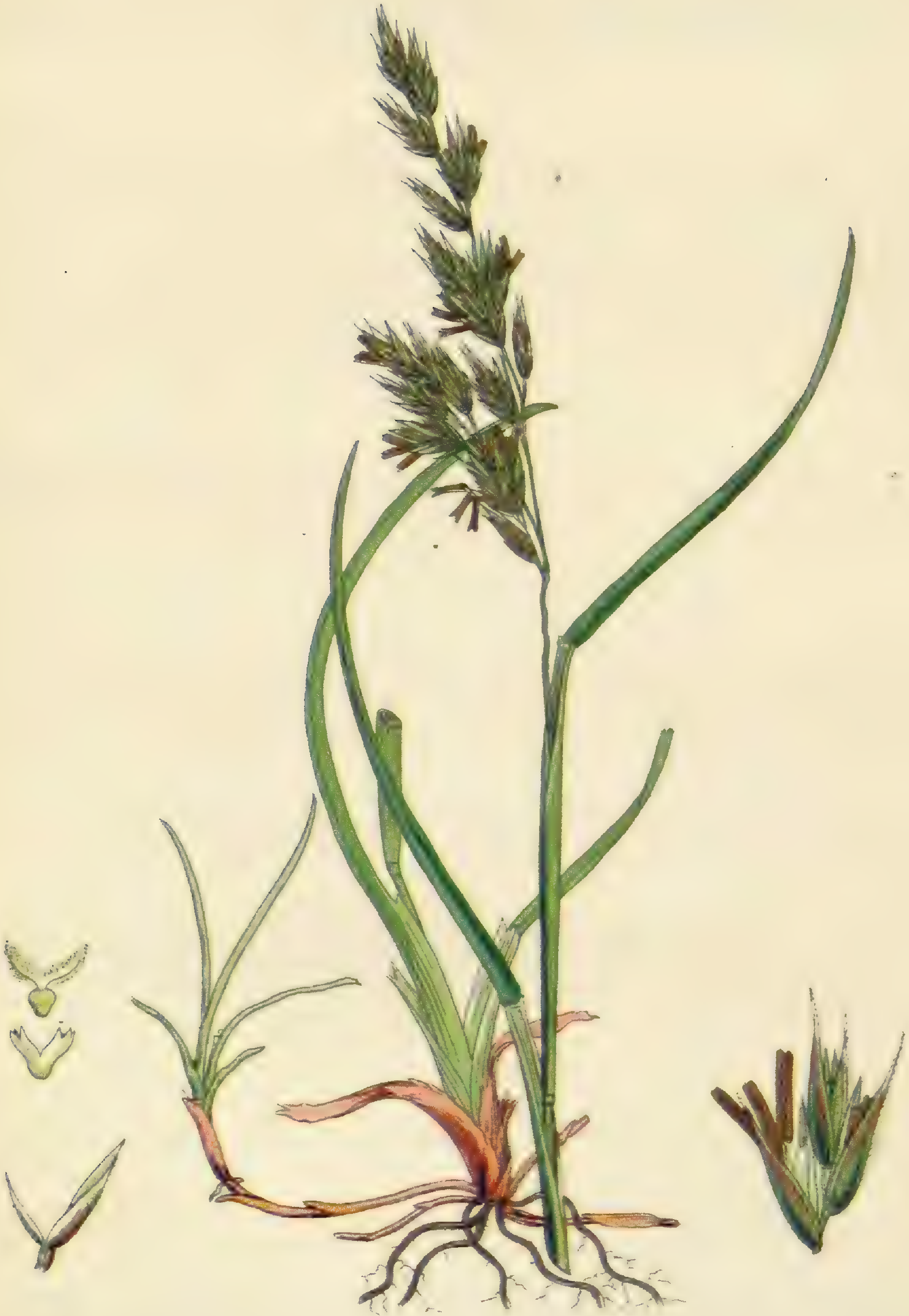
E. B. 1355.

Festuca ovina, vivipara. Sheep's Fescue-grass, viviparous form.



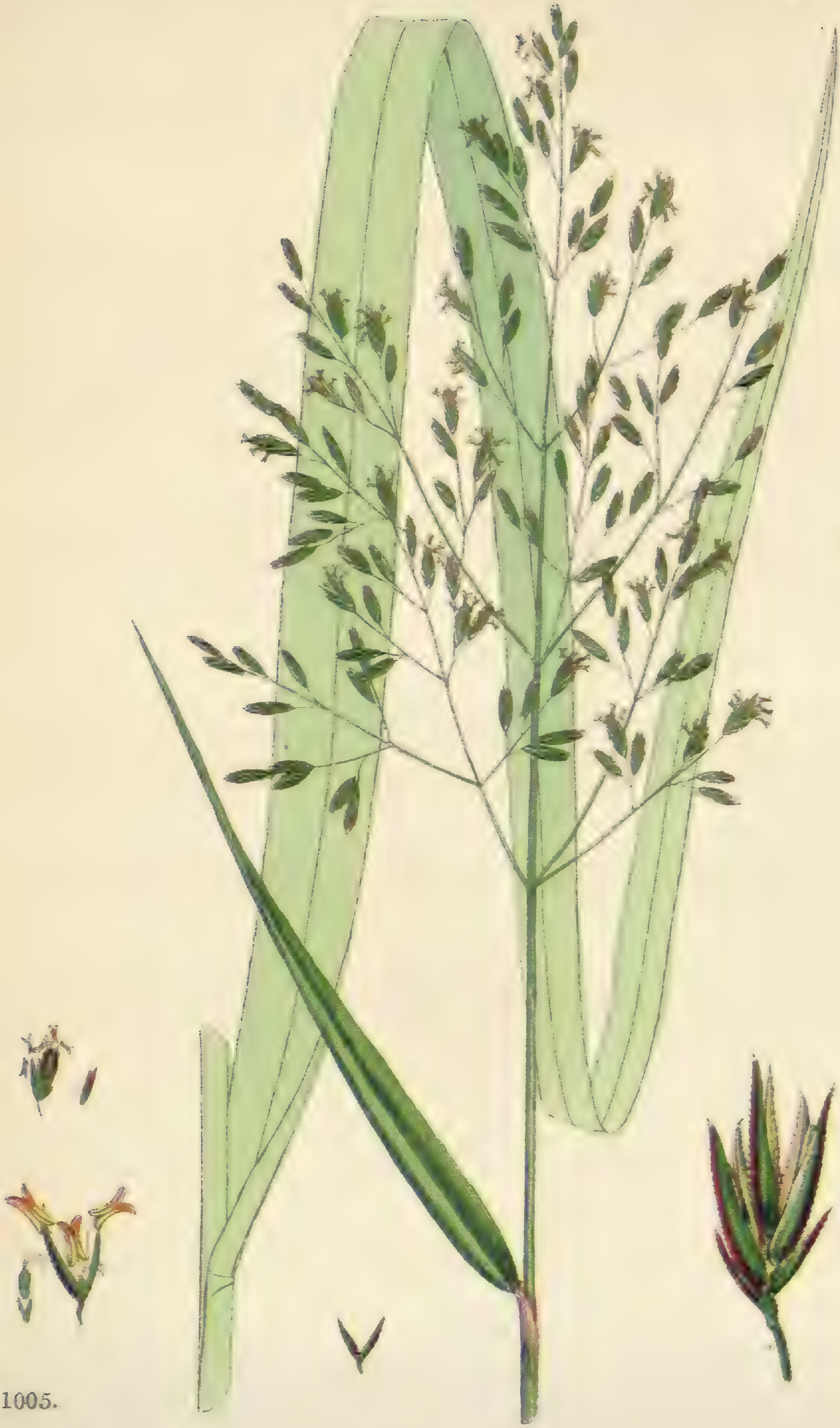
E. B. 470.

Festuca duriuscula.   Hard Fescue-grass.



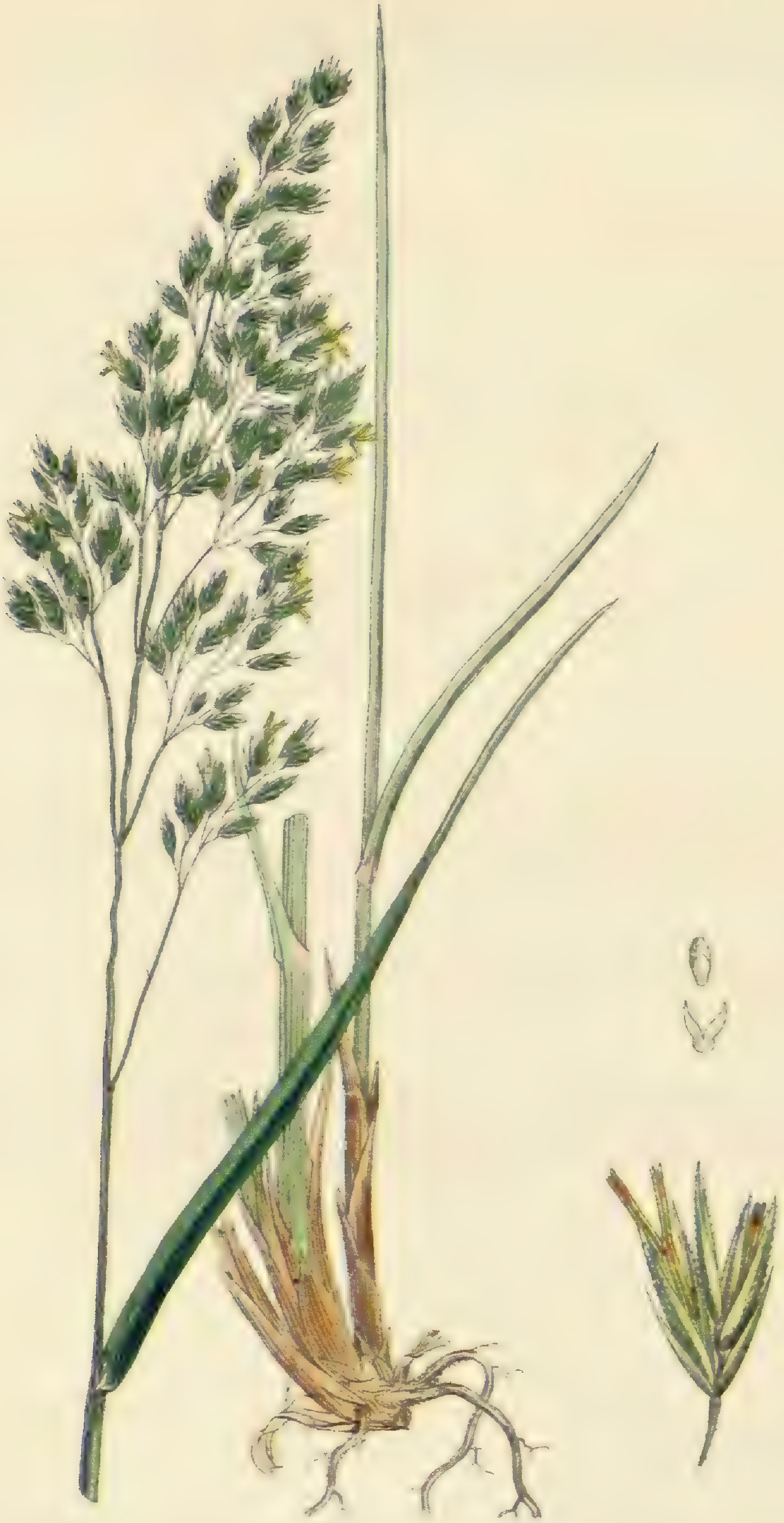
E. B. 2056.

Festuca arenaria. Creeping Fescue-grass.



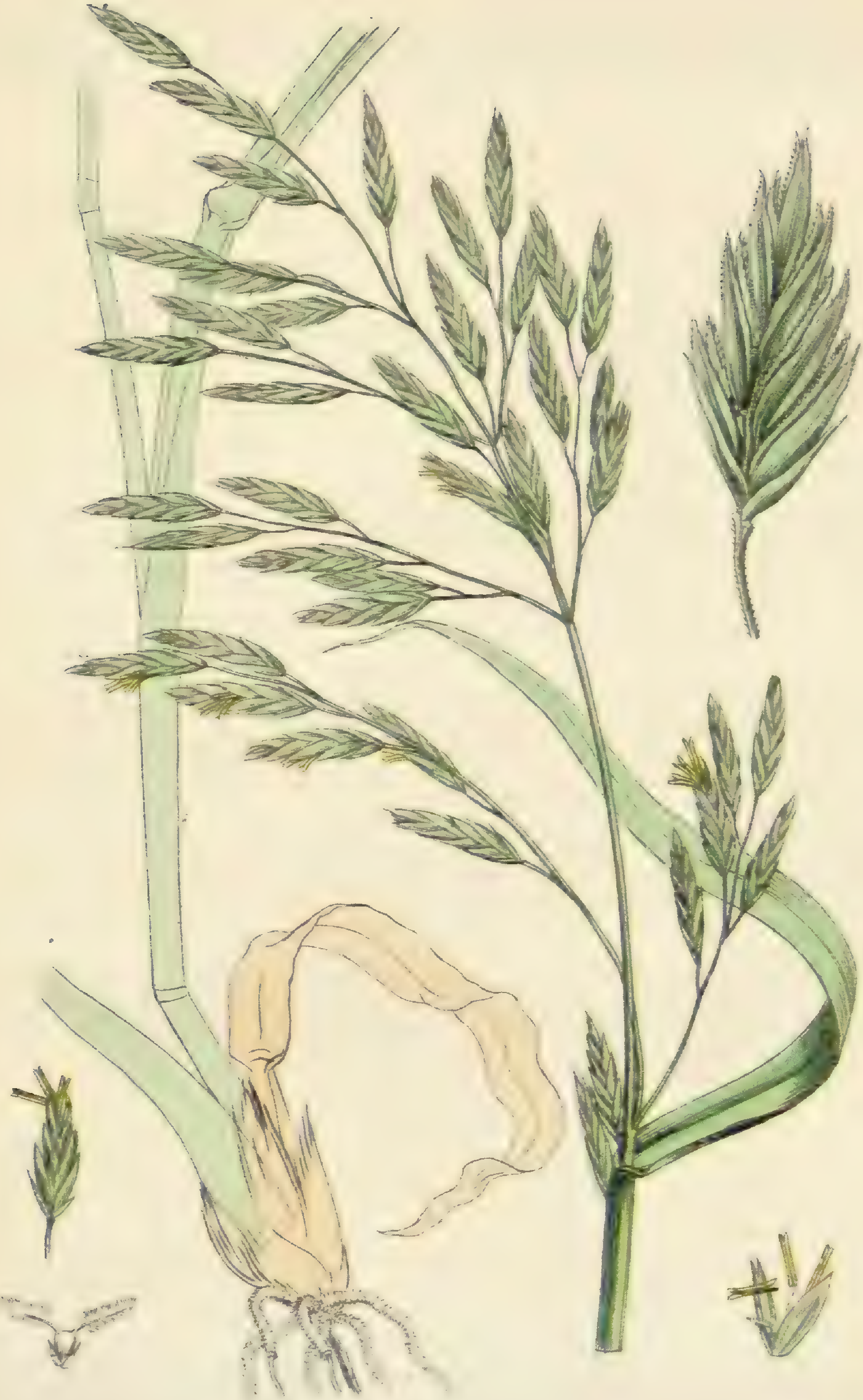
E. B. 1005.

Festuca sylvatica, var. genuina. **Wood Fescue-grass, var. *a*.**



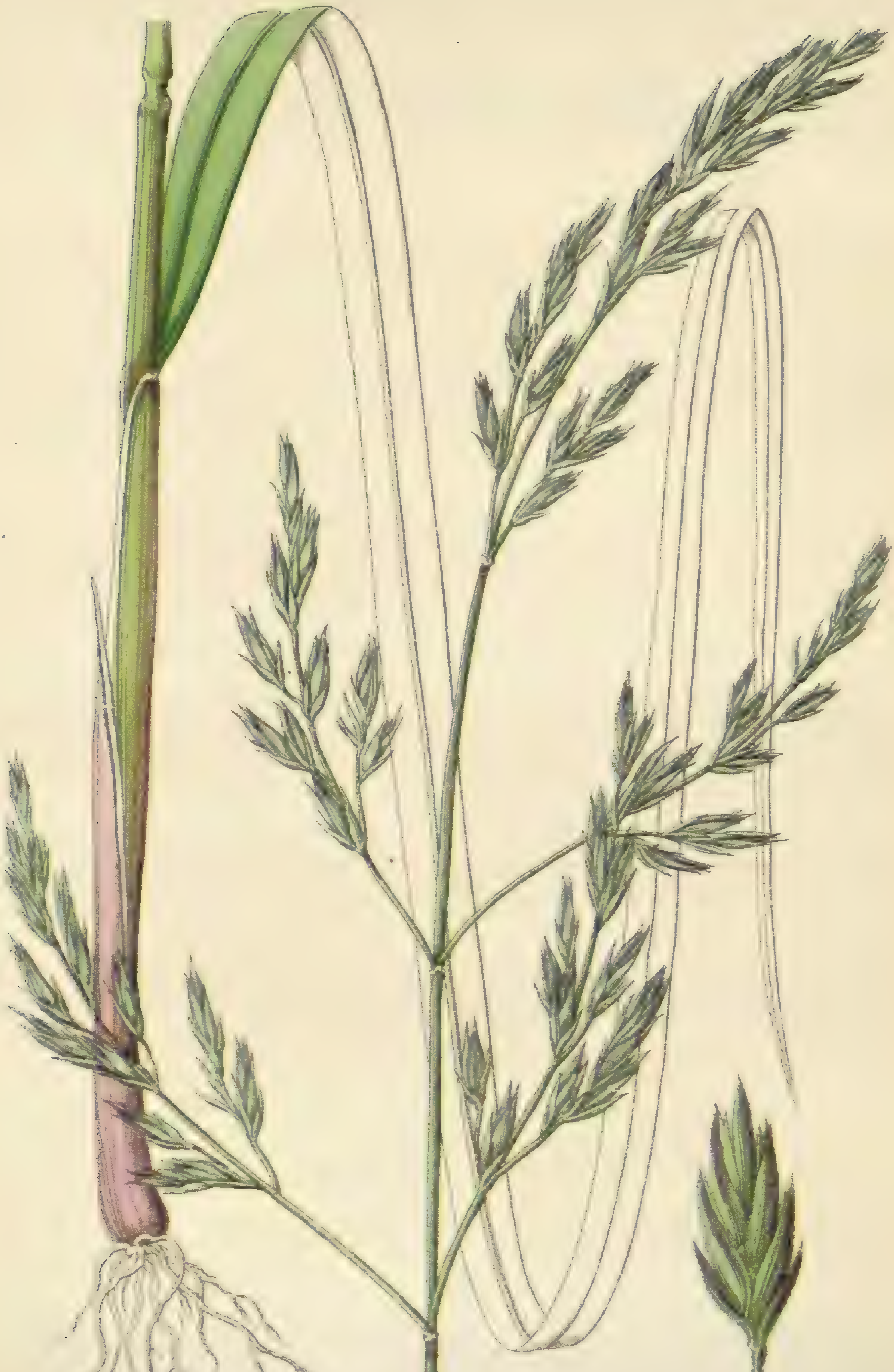
E. B. 2266.

Festucâ sylvatica, var. decidua. Wood Fescue-grass, var. β.

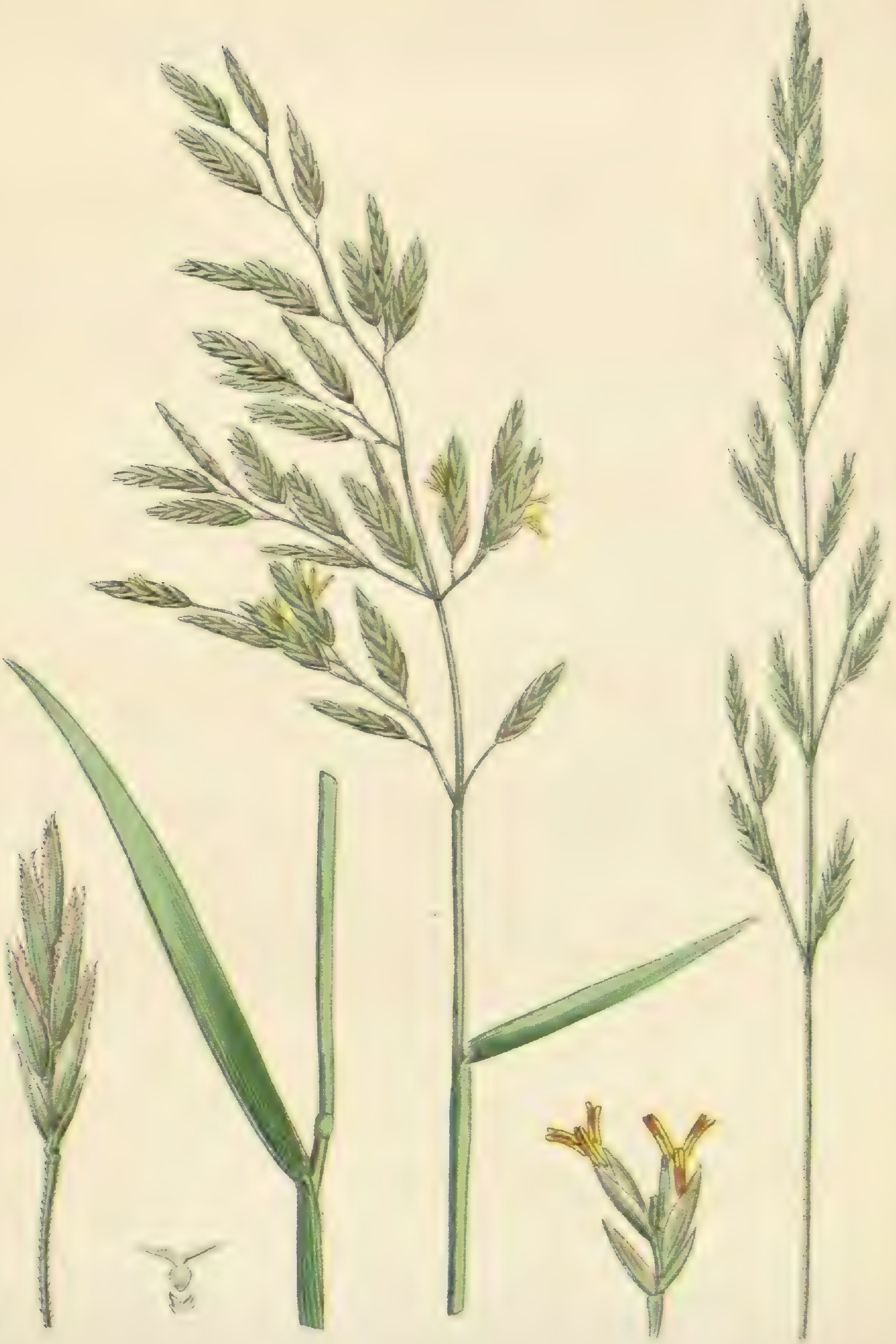


E. B. 1593

Festuca elatior var. genuina. **Tall Fescue-grass, var. α.**

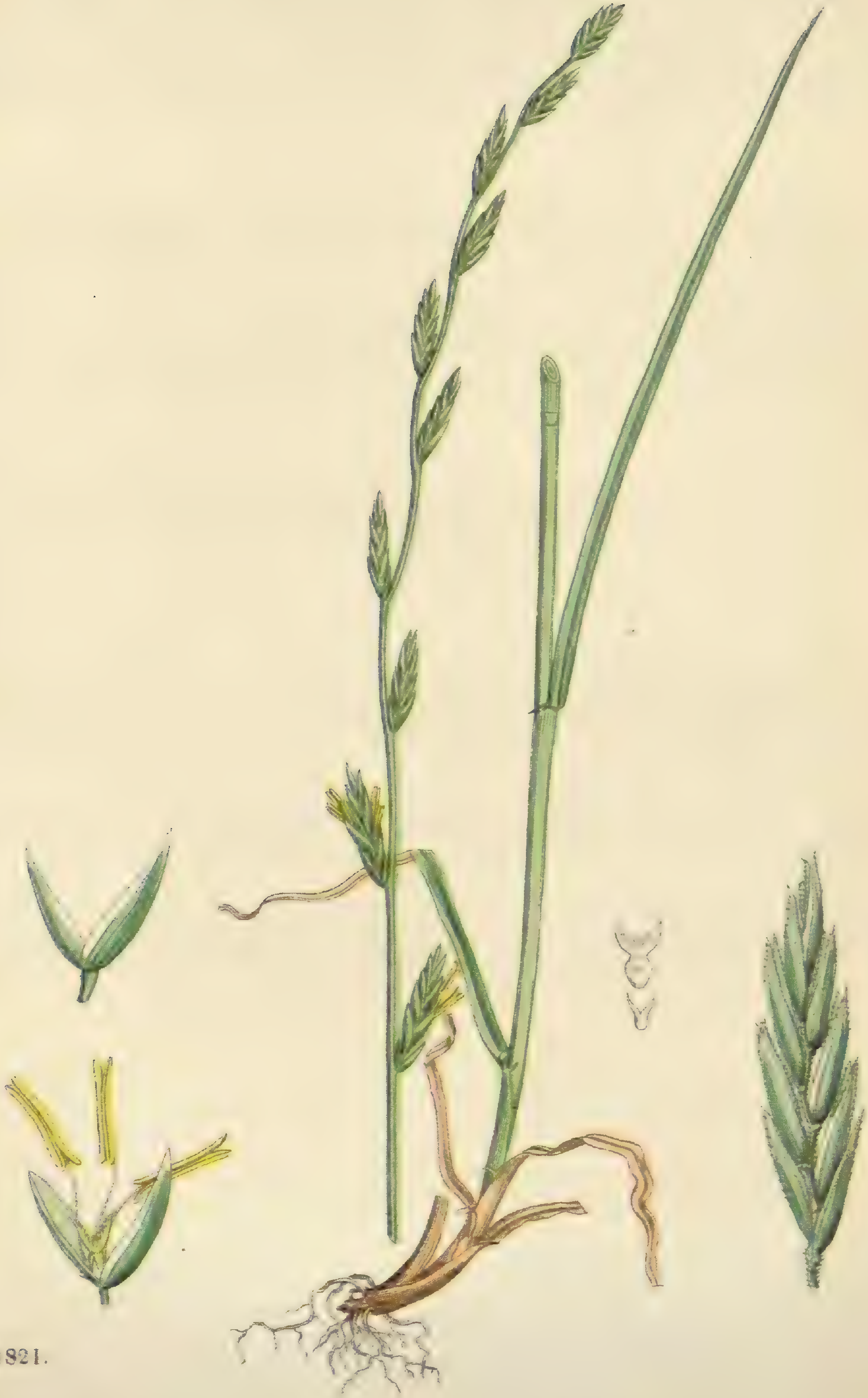


Festuca elatior, var. arundinacea. Tall Fescue-grass, var. β.



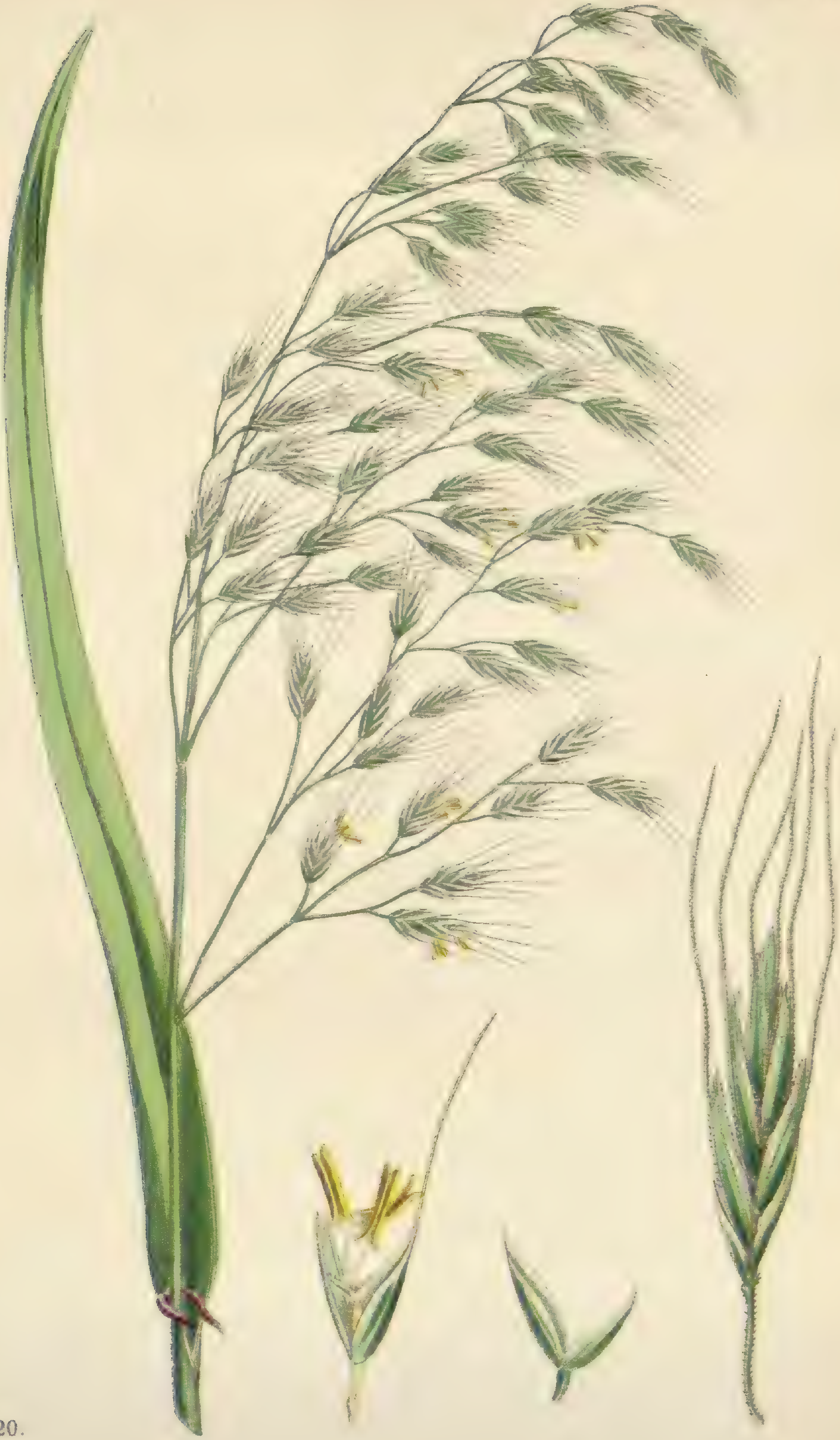
E. B. 1592.

Festuca pratensis, var. genuina. Meadow Fescue-grass, var. α.



E. B. 1821.

Festuca pratensis, var. loliacea. Meadow Fescue-grass, var. *β*.

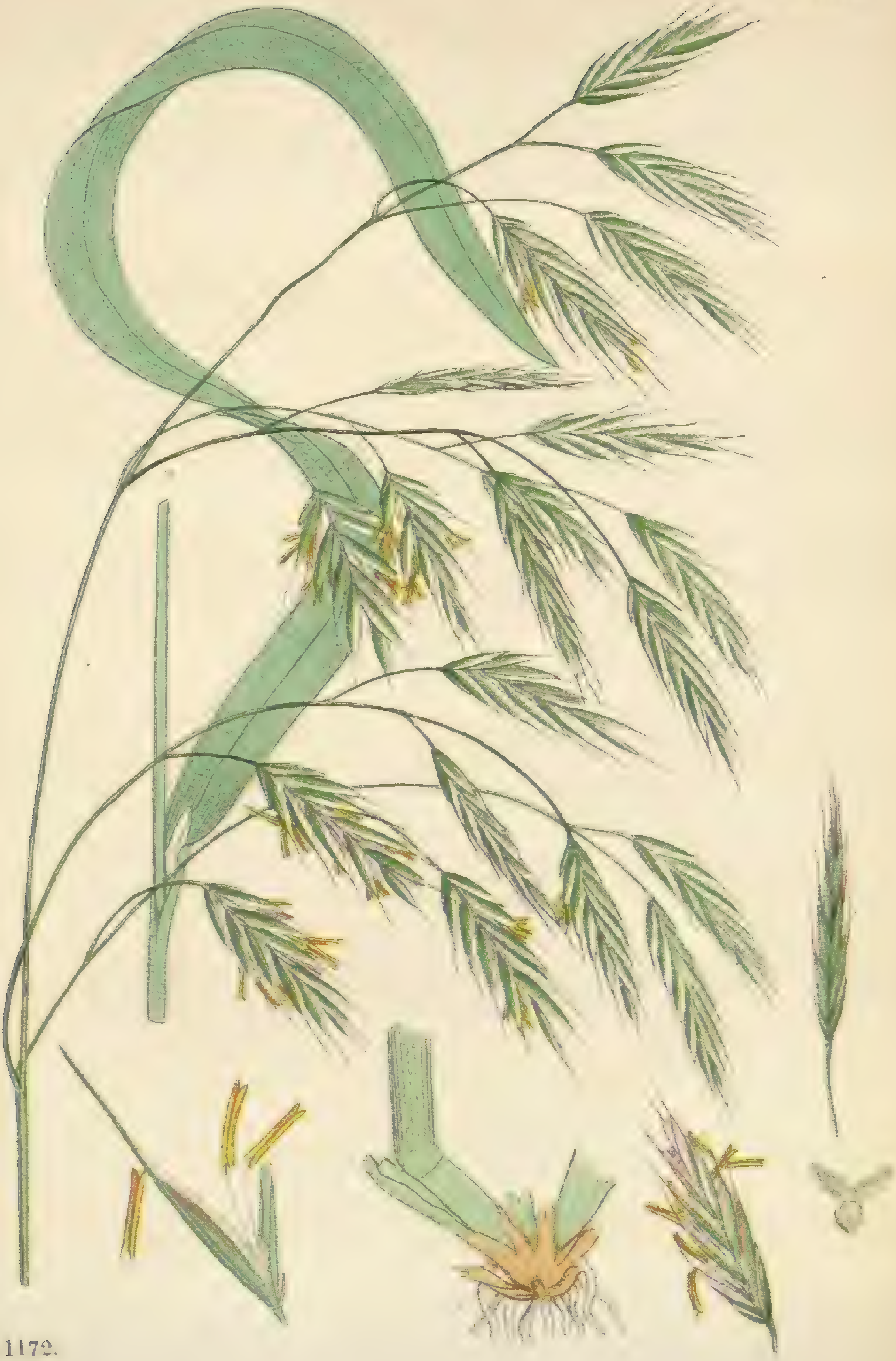


E. B. 1820.

Bromus giganteus, var. genuinus. Tall Brome-grass, var. *a*.

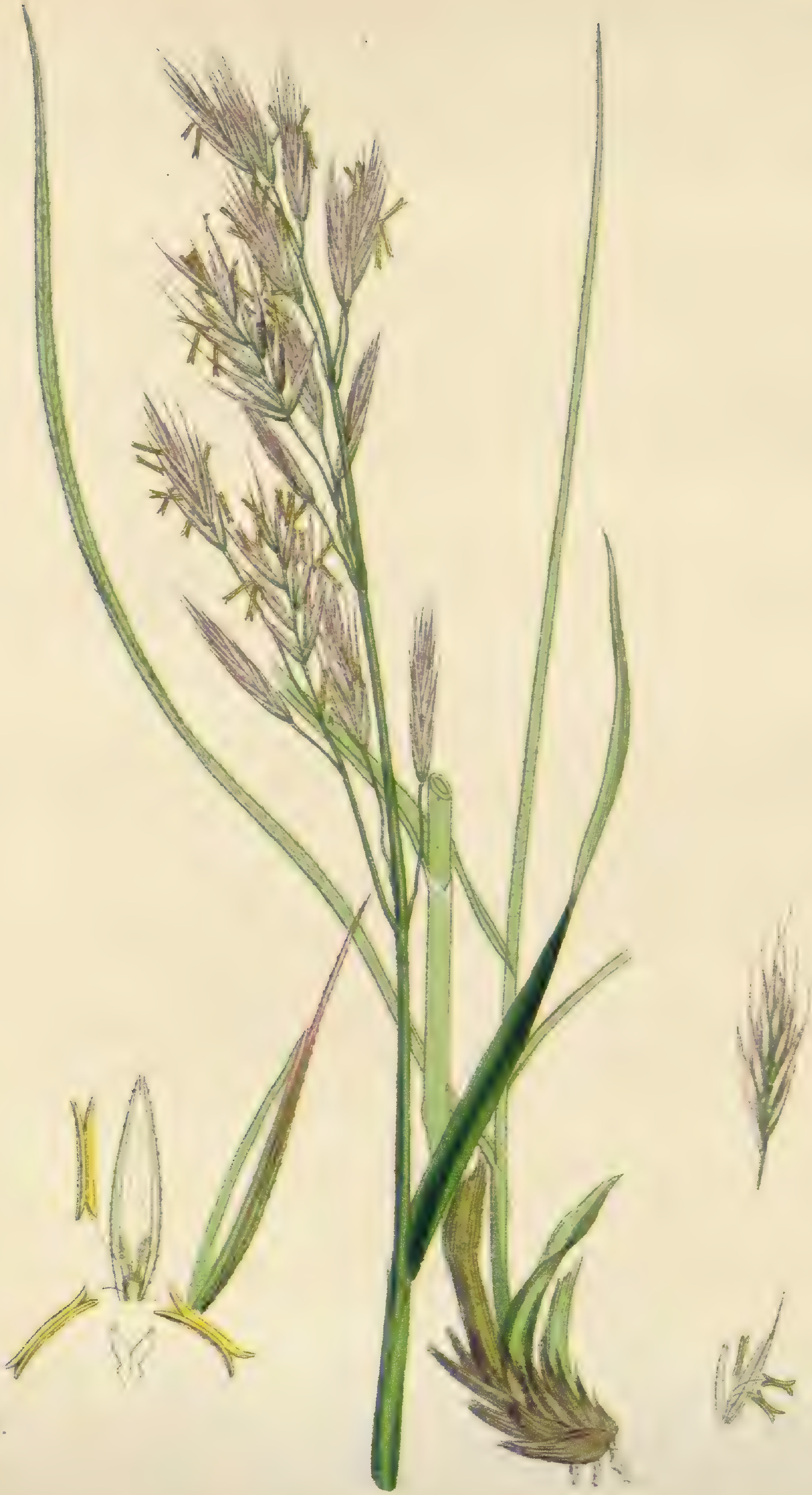
E. B. 1918.

Bromus giganteus, var. triflorus. Tall Brome-grass, var. β.



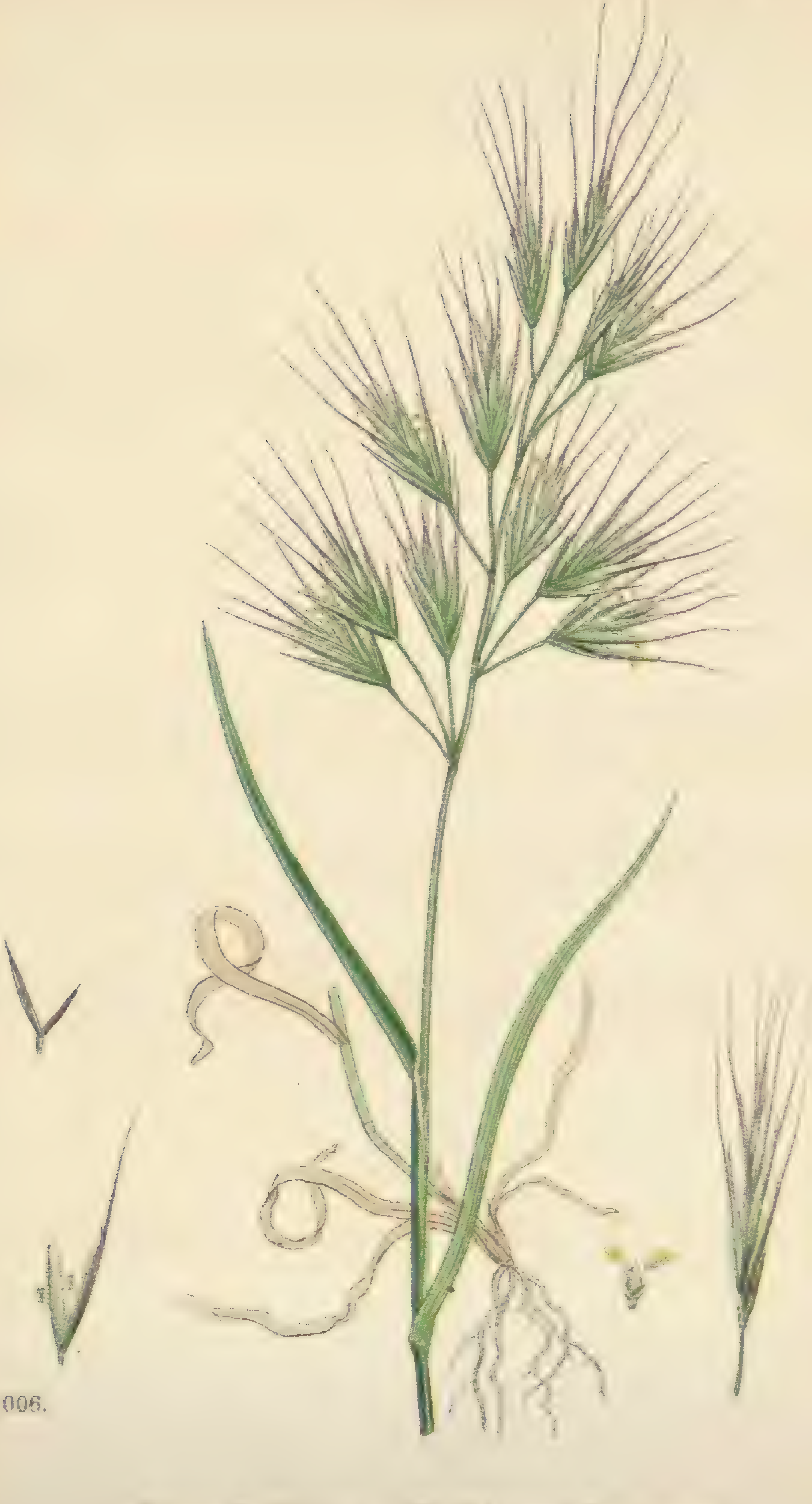
E. B. 1172.

Bromus asper. Rough Brome-grass.



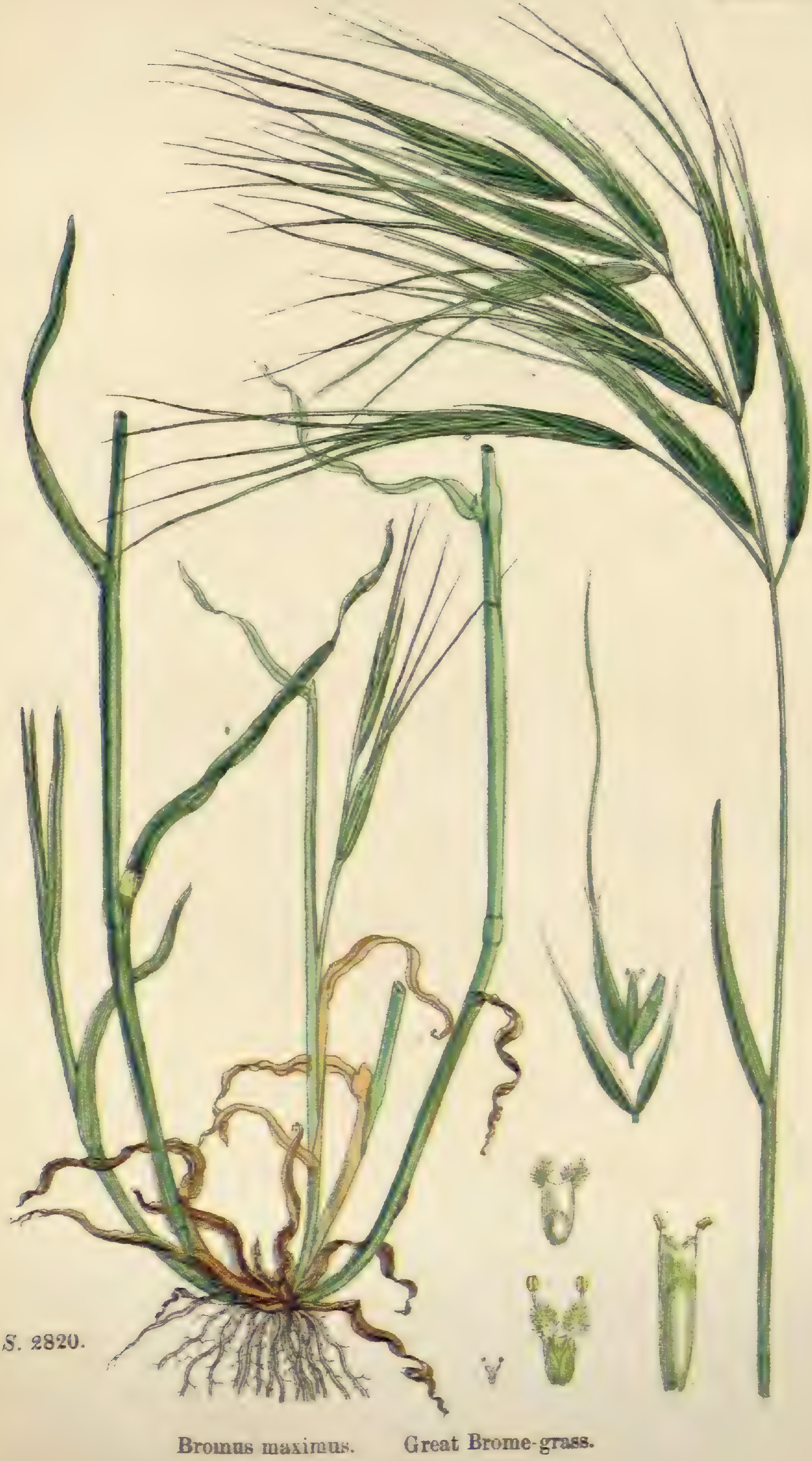
E. B. 471.

Bromus erectus. Upright perennial Brome-grass.



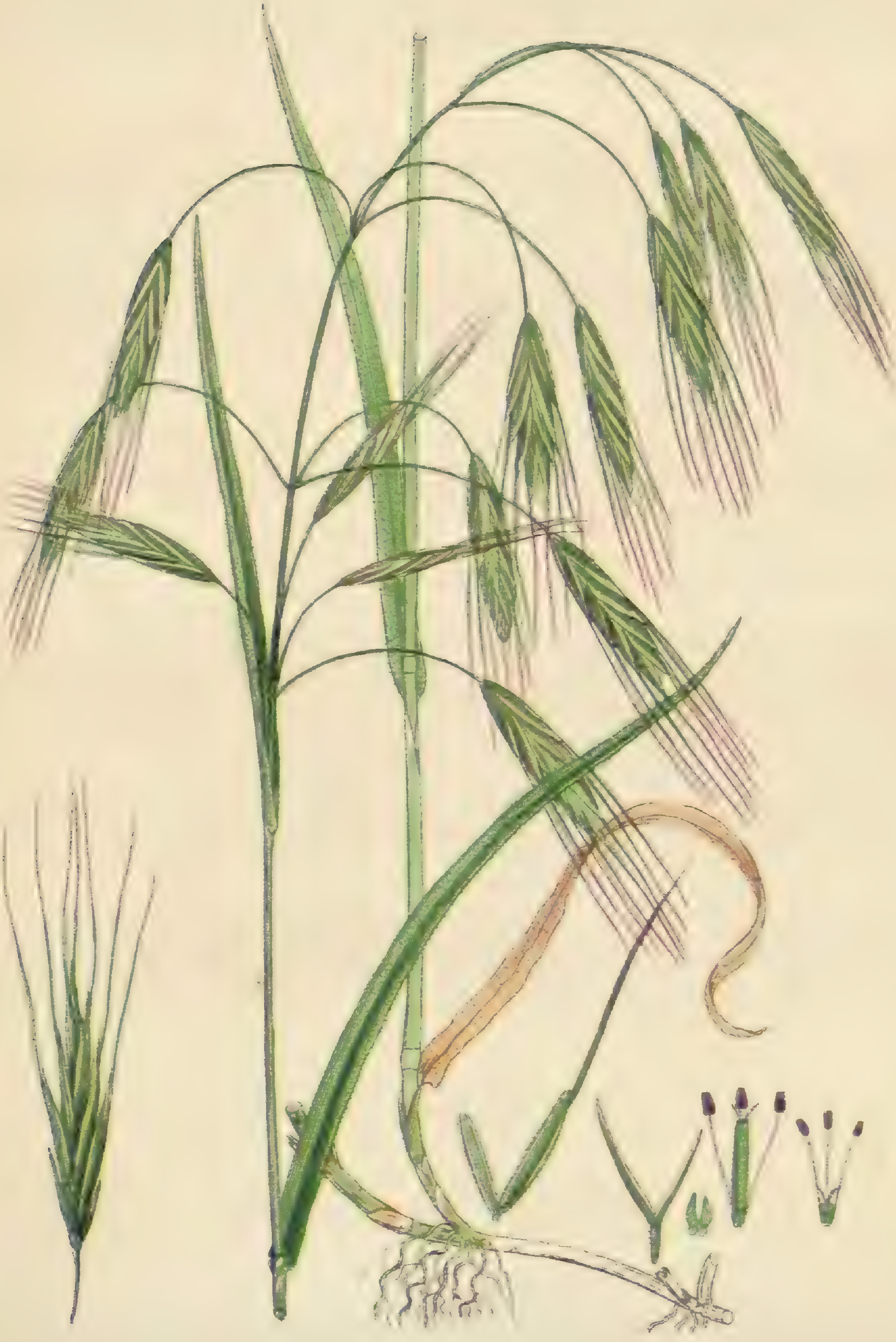
E. B. 1006.

Bromus Madritensis. Upright annual Brome-grass.



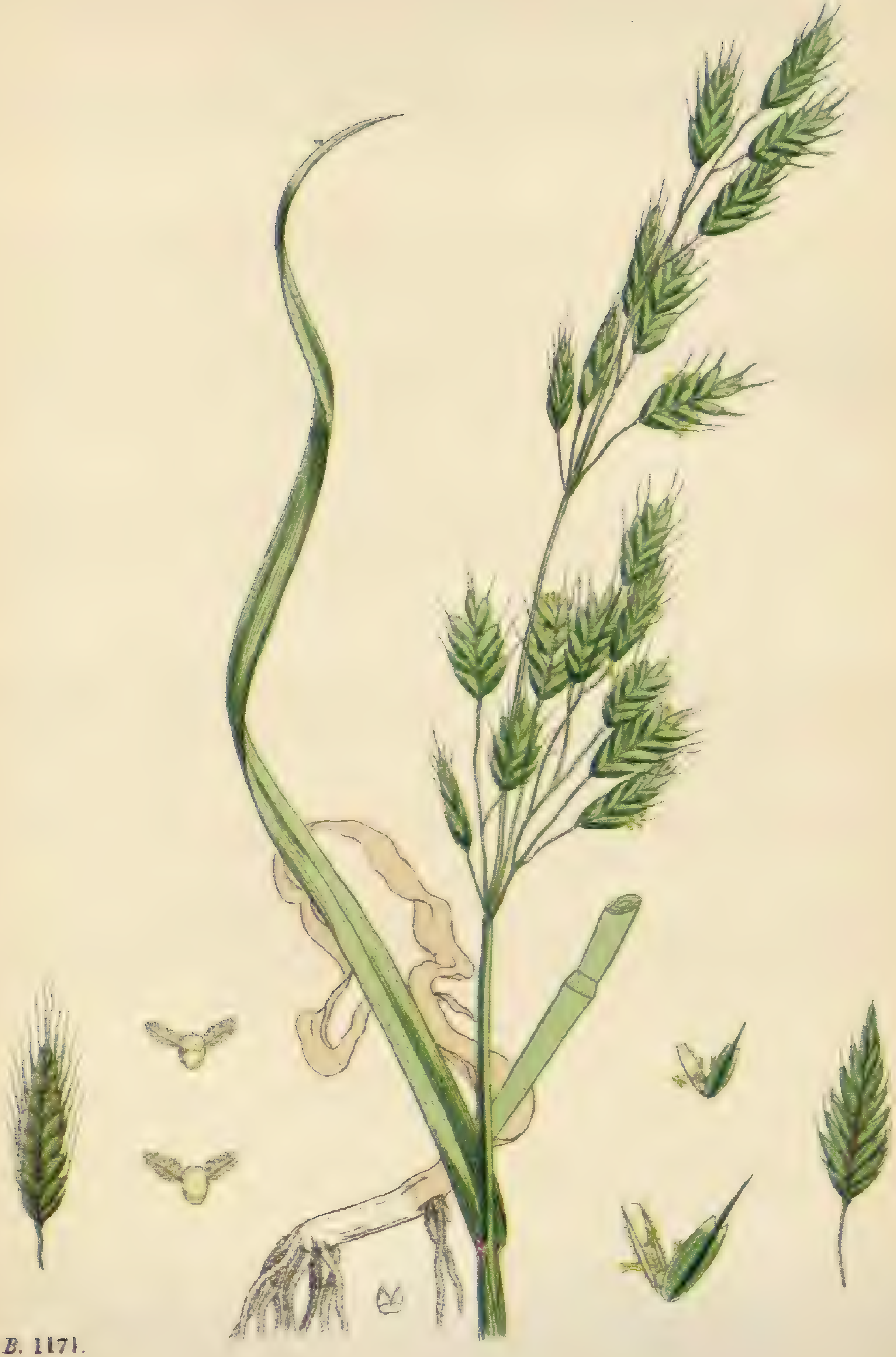
E. B. S. 2820.

Bromus maximus. Great Brome-grass.



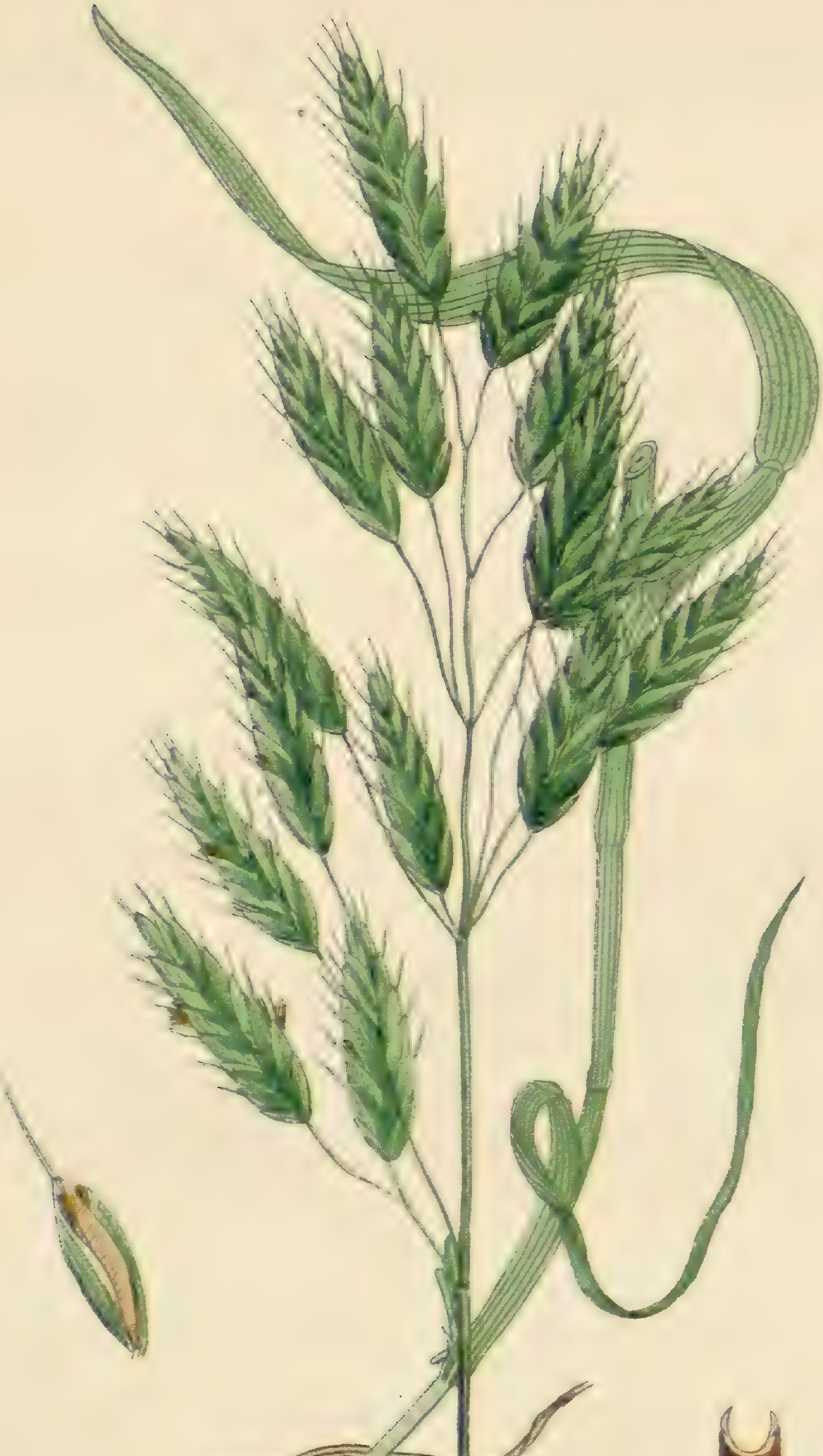
E. B. 1030.

Bromus sterilis. Barren Brome-grass.



E. B. 1171.

Bromus secalinus, var. genuinus. Rye Brome-grass, var. *a*.



E. B. 1884.

Bromus secalinus, var. velutinus. Rye Brome-grass, var. β.

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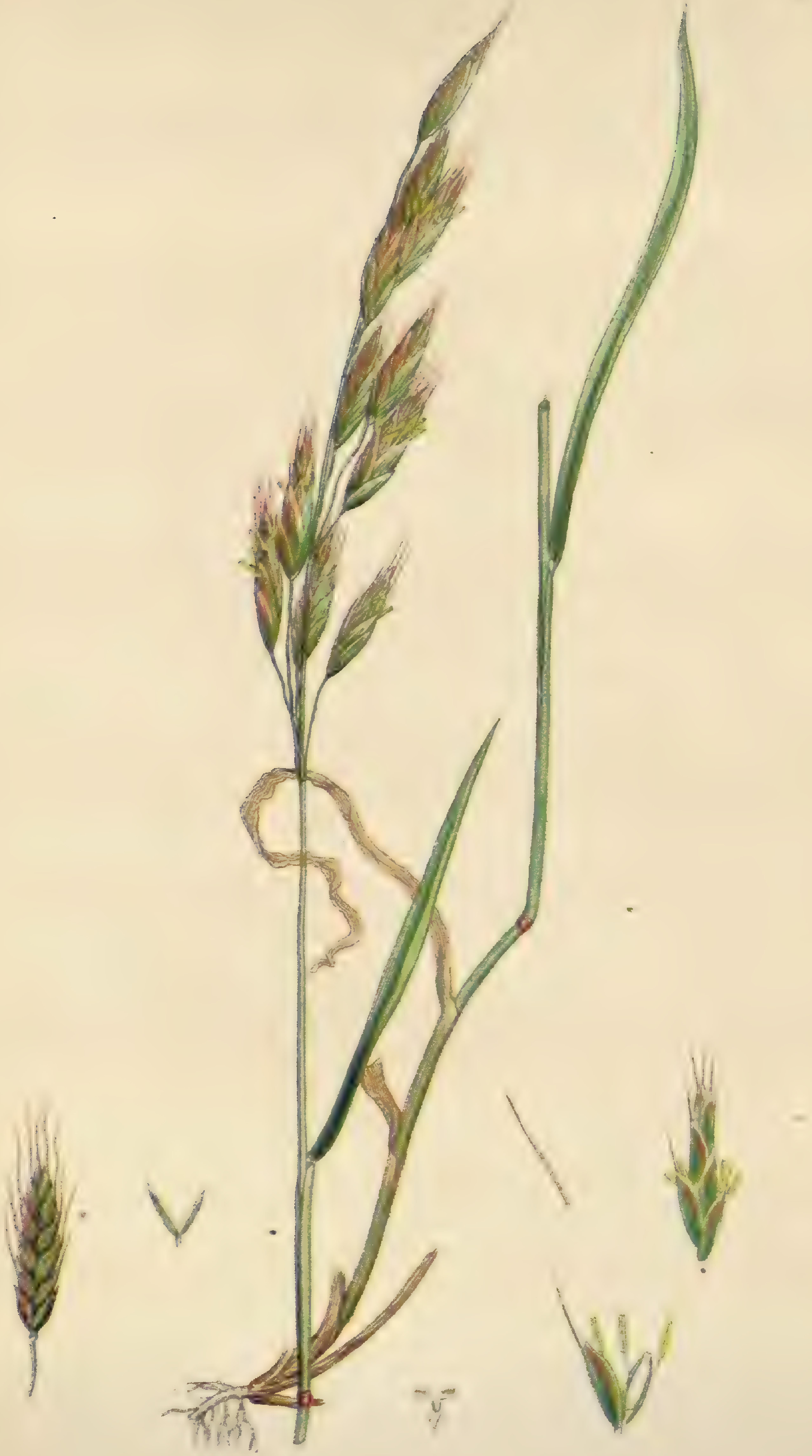
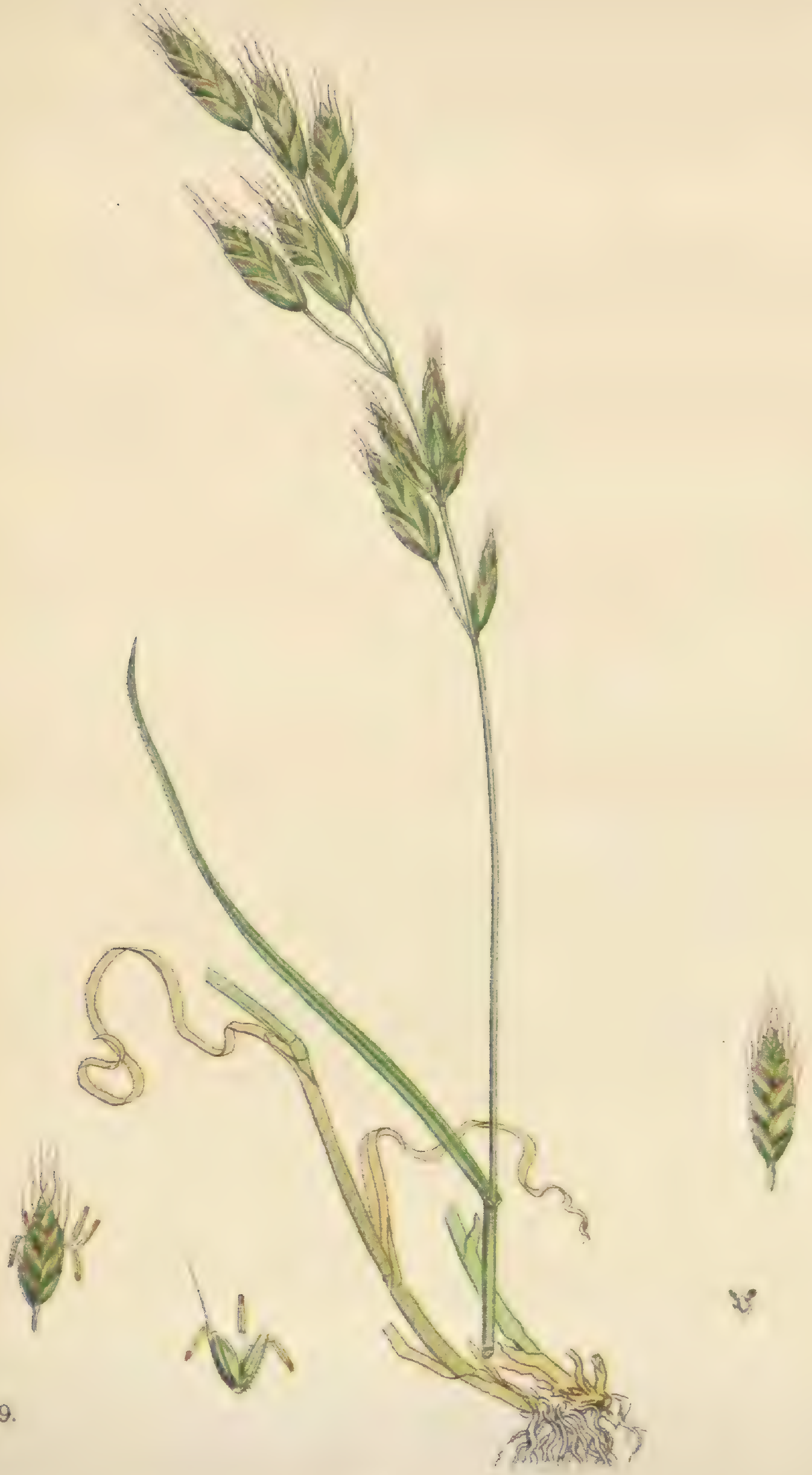


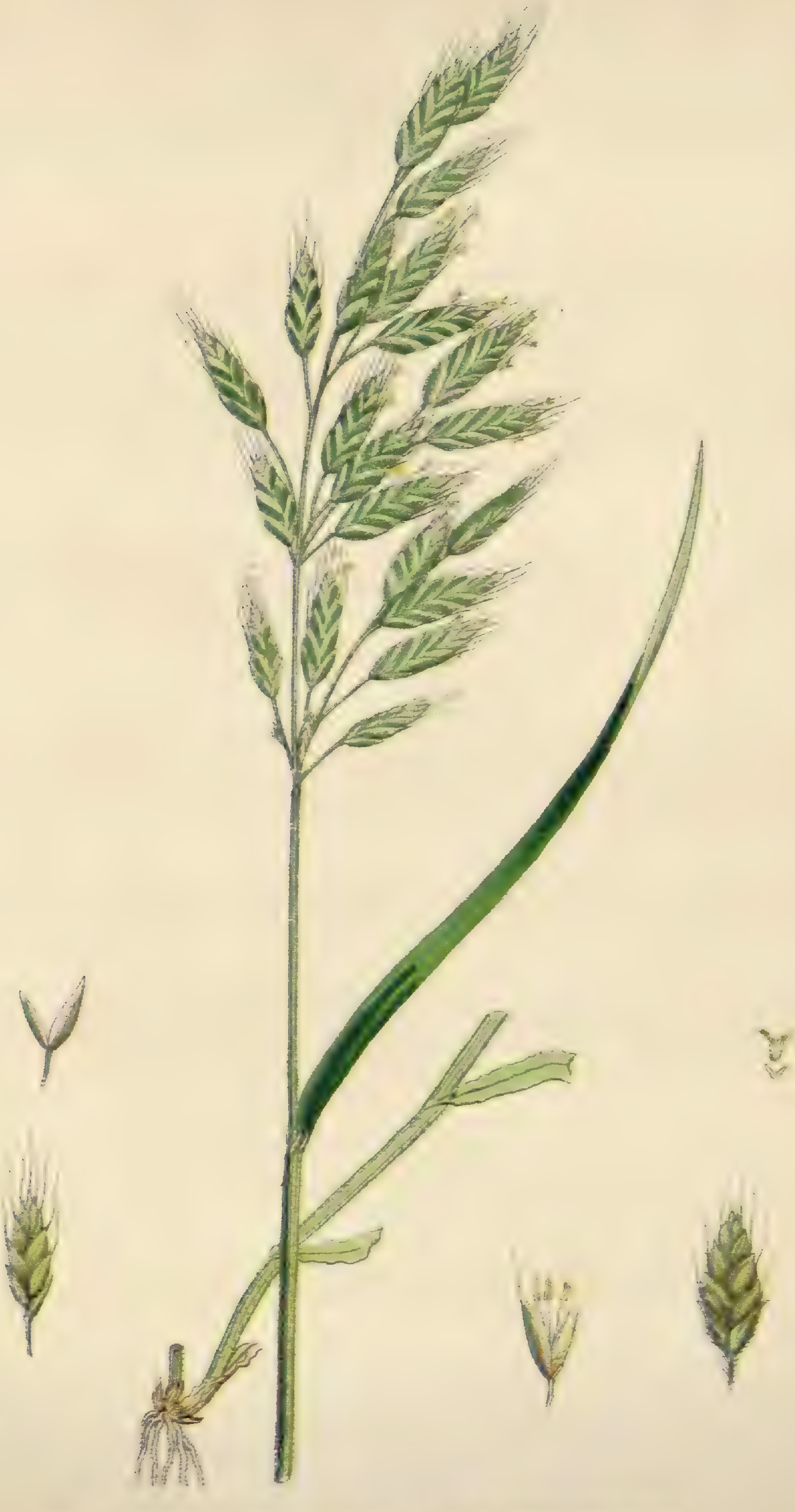
E. B. 920.

Bromus commutatus. Confused Brome-grass.



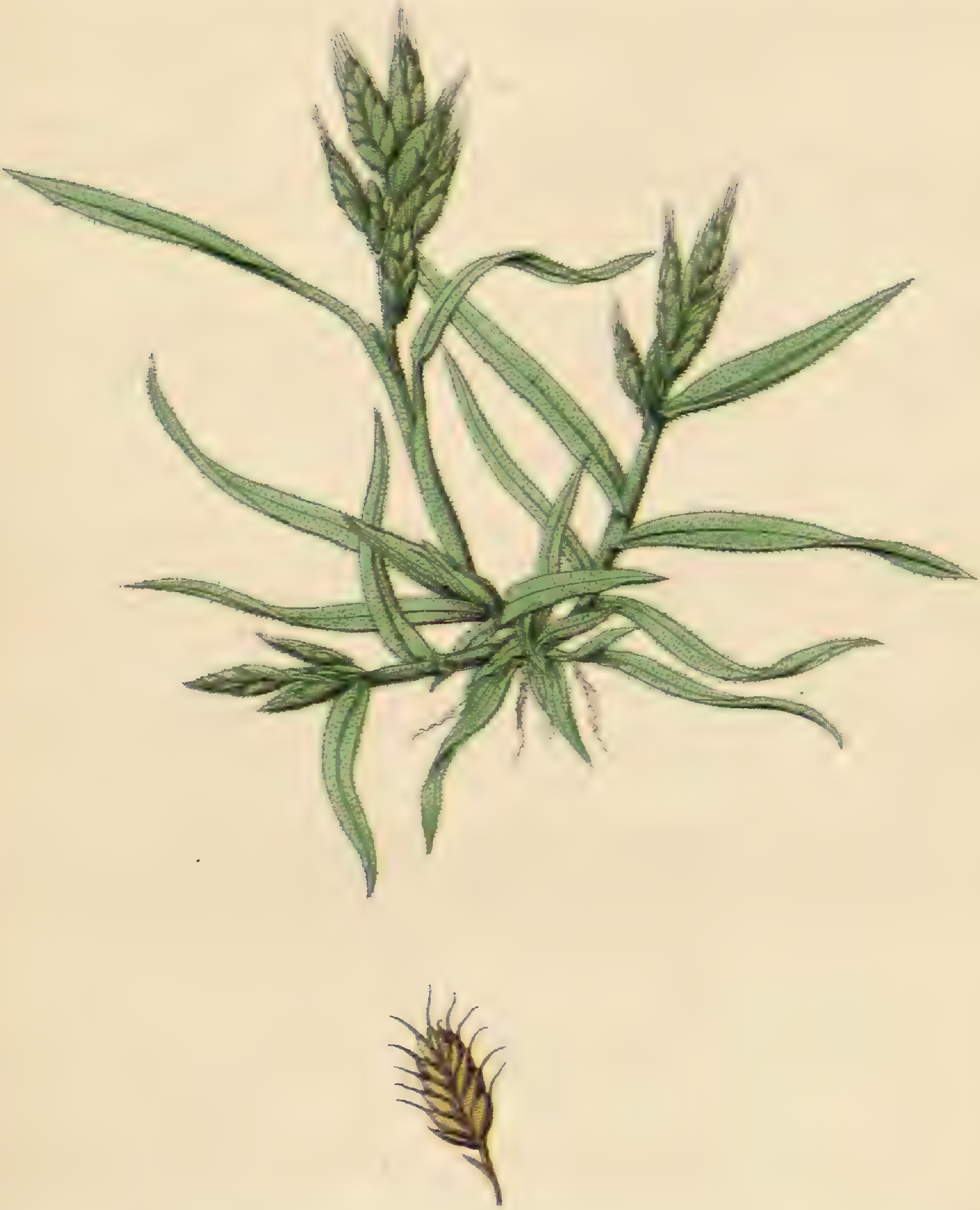
E. B. 1079.

Bromus racemosus. Racemose Brome-grass.

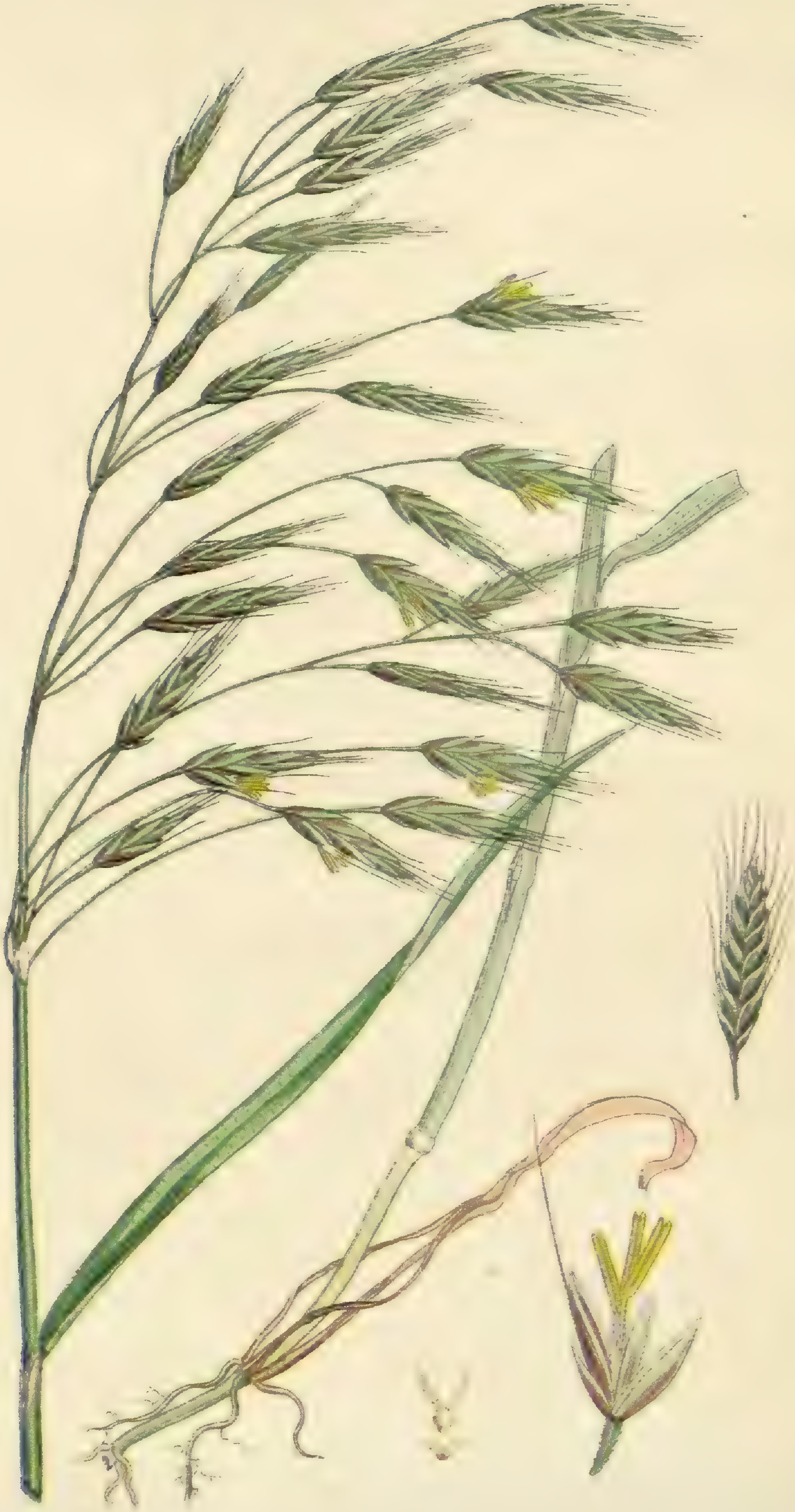


E. B. 1078.

Bromus mollis, var. genuinus. Soft Brome-grass, var. *α*.

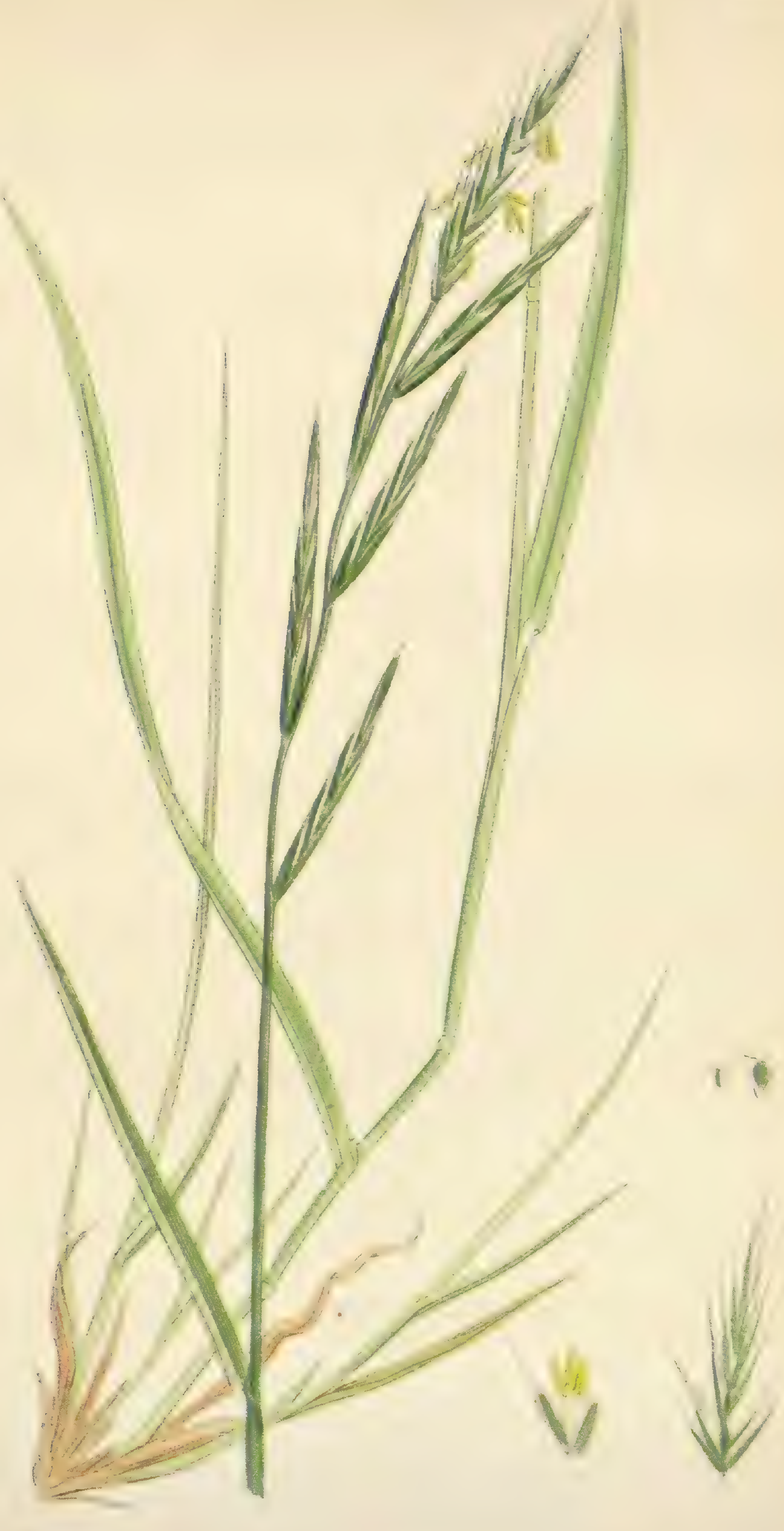


Bromus mollis, var. Ferronii. Soft Brome-grass, var. γ.



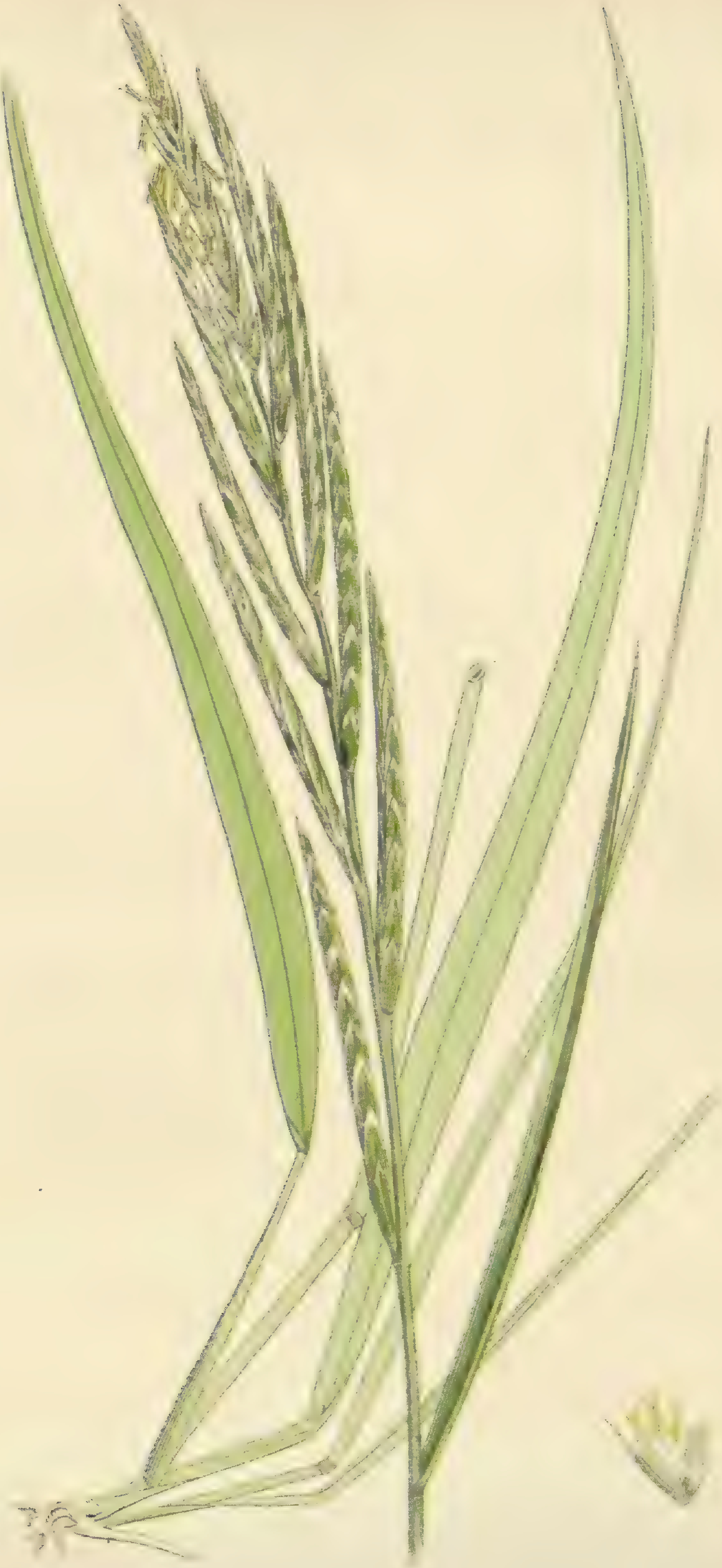
E. B. 1984.

Bromus arvensis. Field Brome-grass.



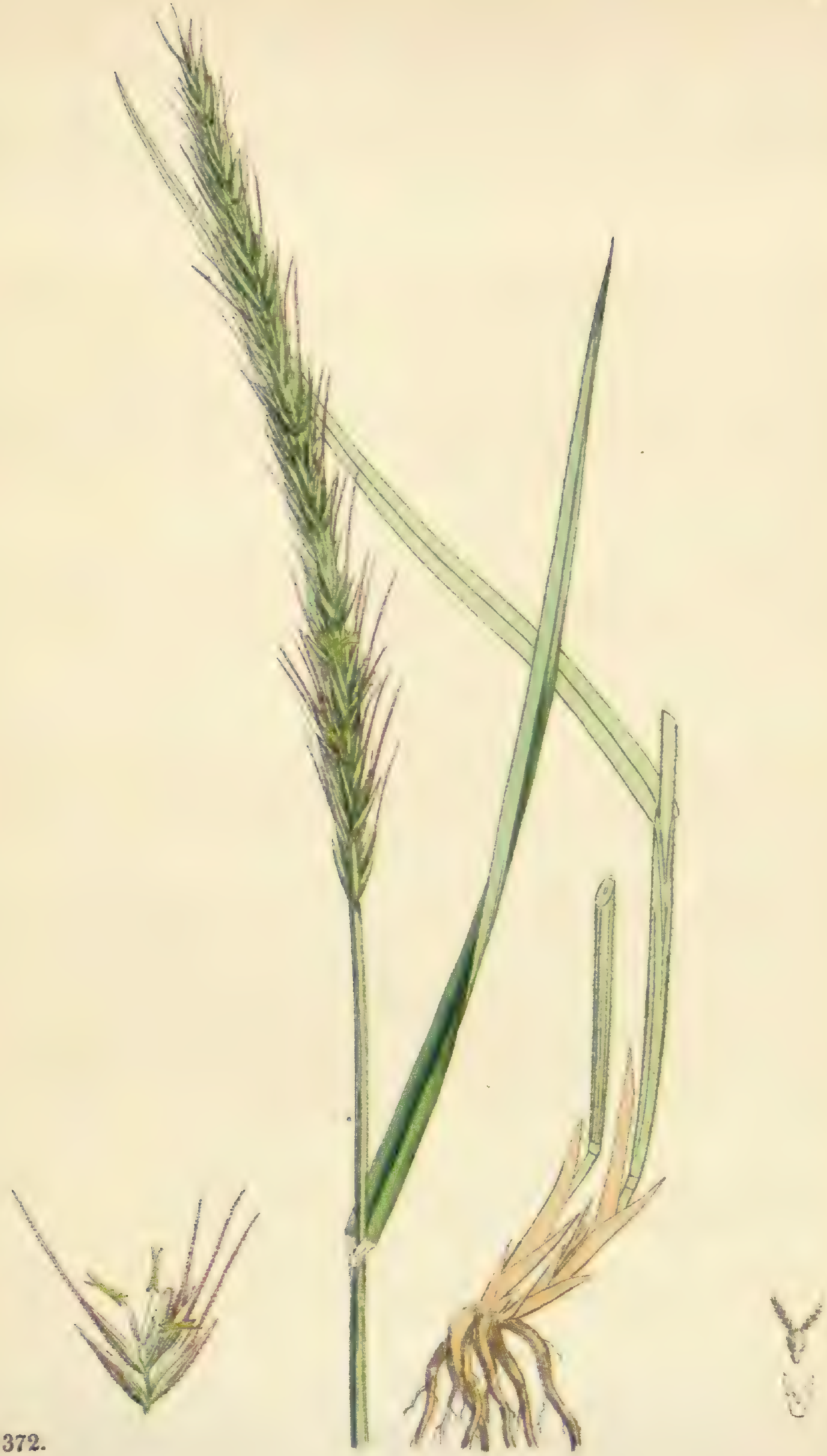
E. B. 729.

Brachypodium sylvaticum.   Wood False-Brome-grass.



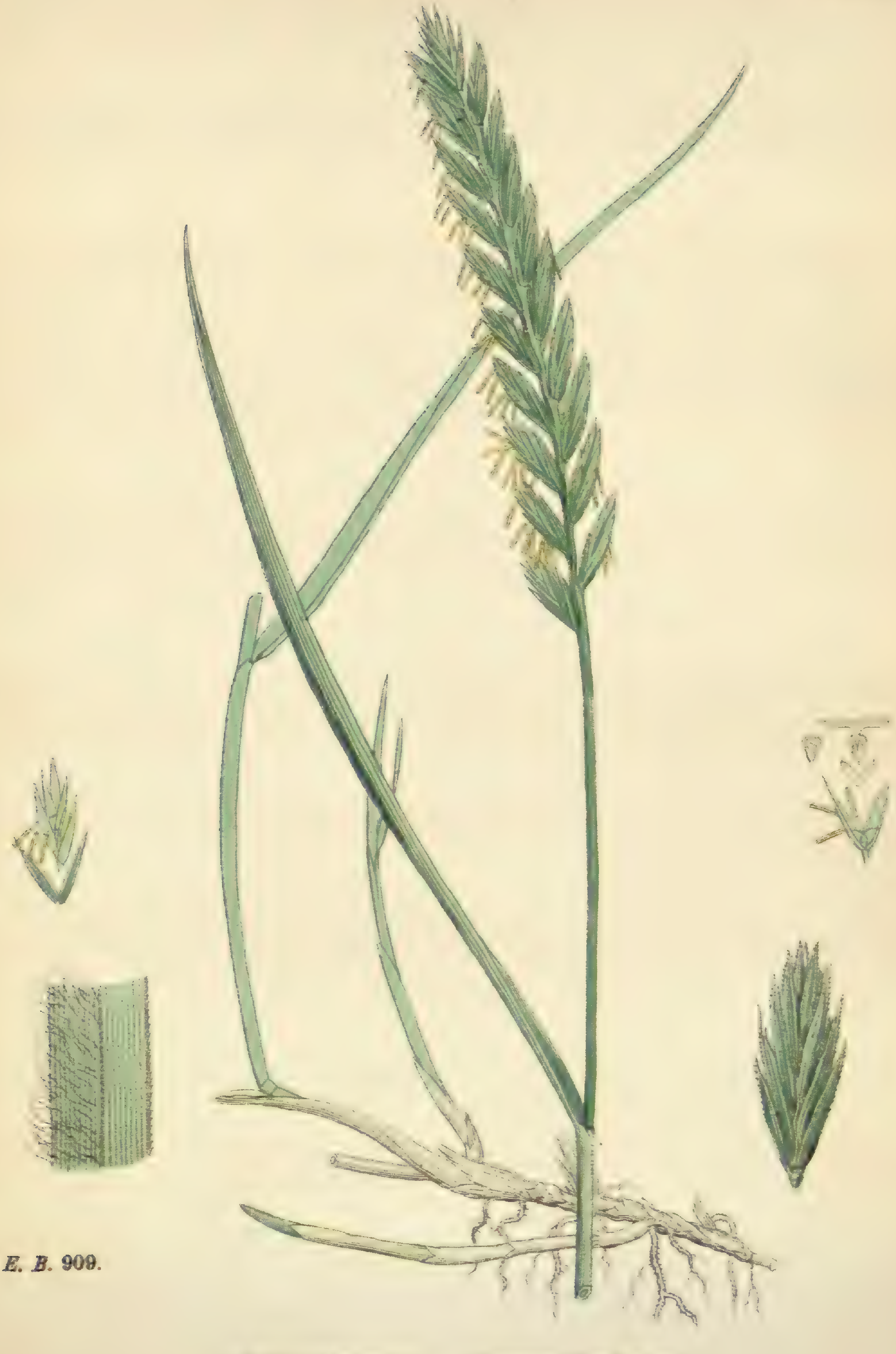
E. B. 730.

Brachypodium pinnatum. Barren False-Brome-grass.



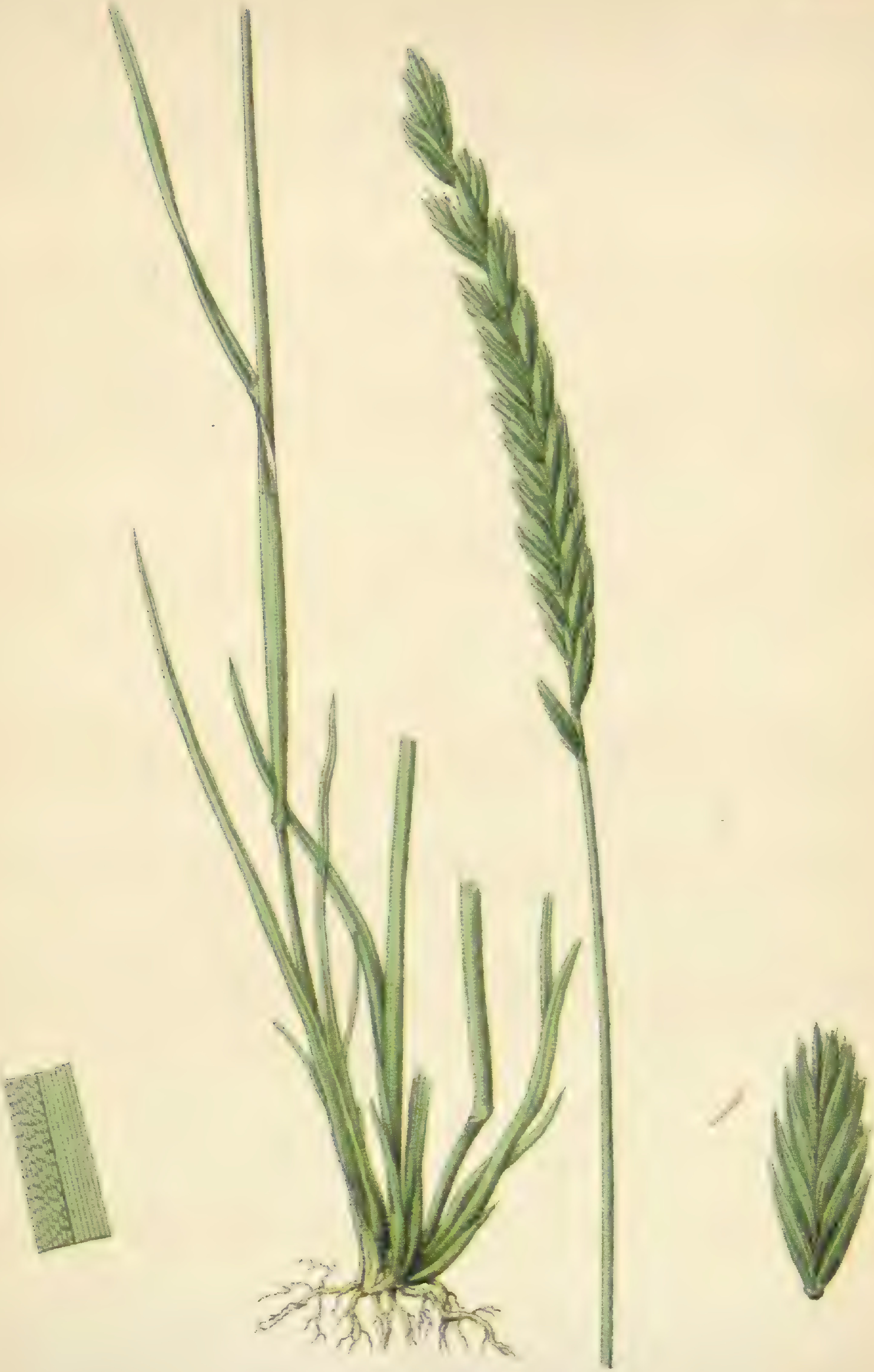
E. B. 1372.

Triticum caninum. Wood Couch-grass.

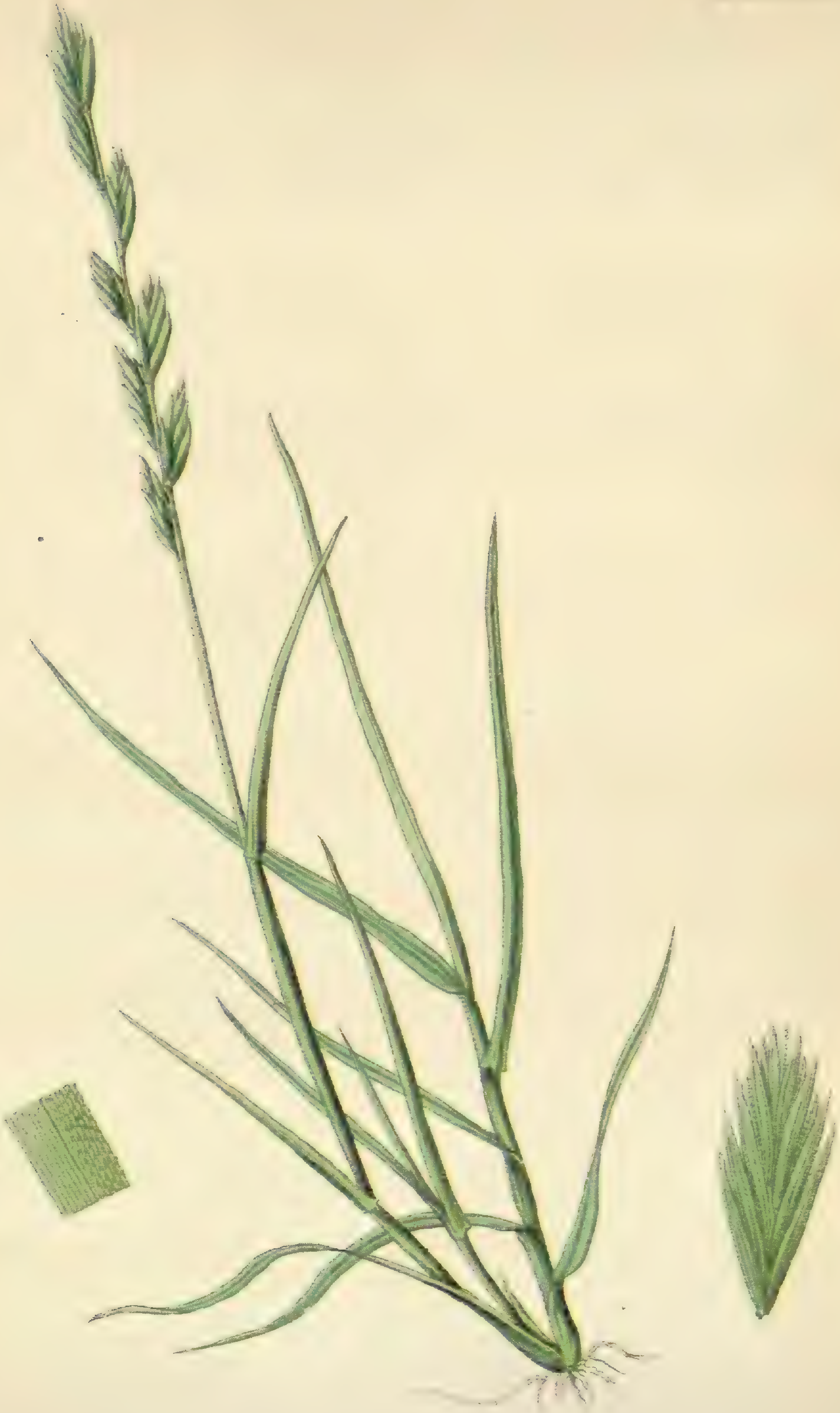


E. B. 909.

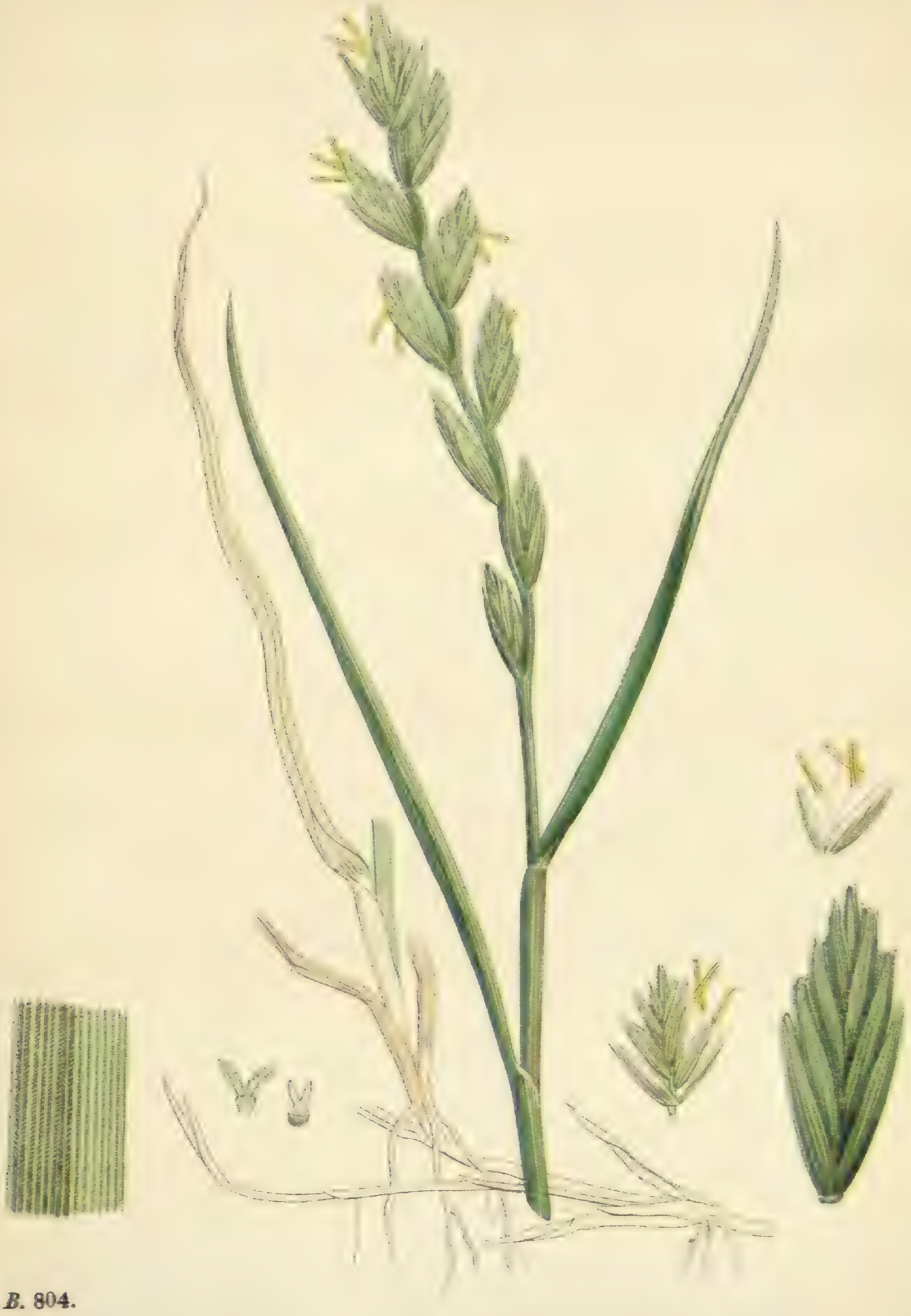
Triticum eu-repens. Common Couch-grass.



Triticum pungens.   Erect Sea Couch-grass.

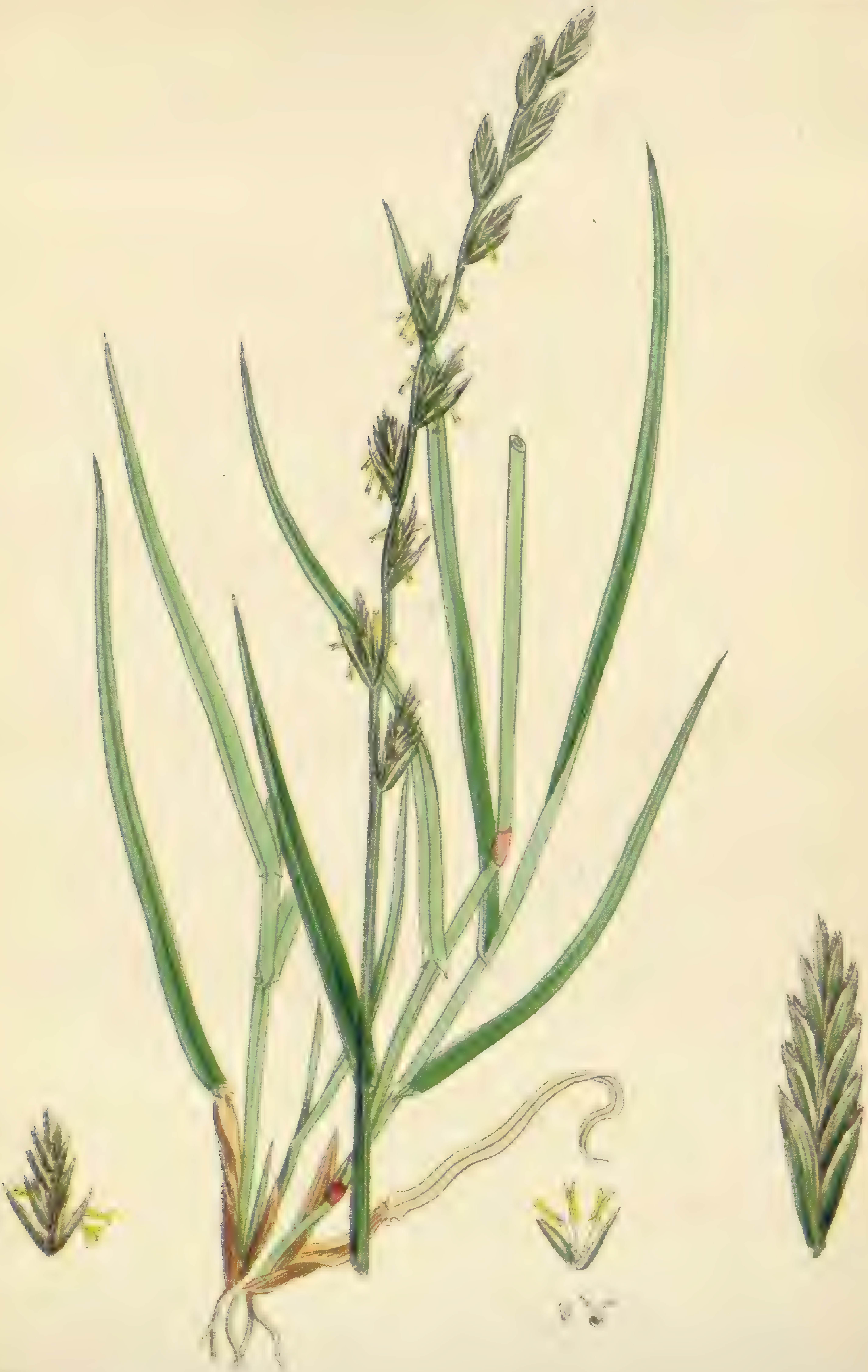


Triticum acutum. Decumbent Sea Couch-grass.



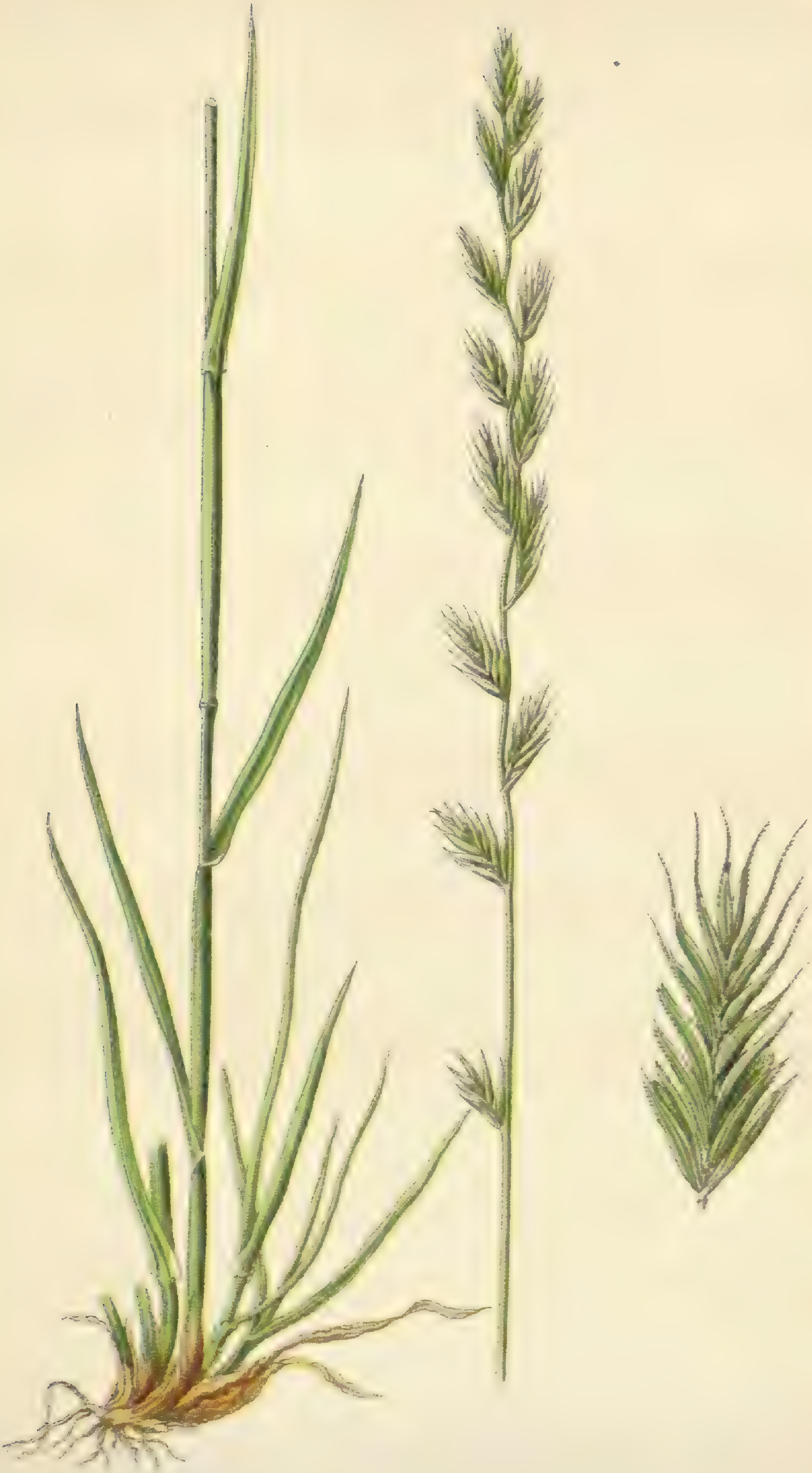
E. B. 804.

Triticum junceum. Sand Couch-grass,

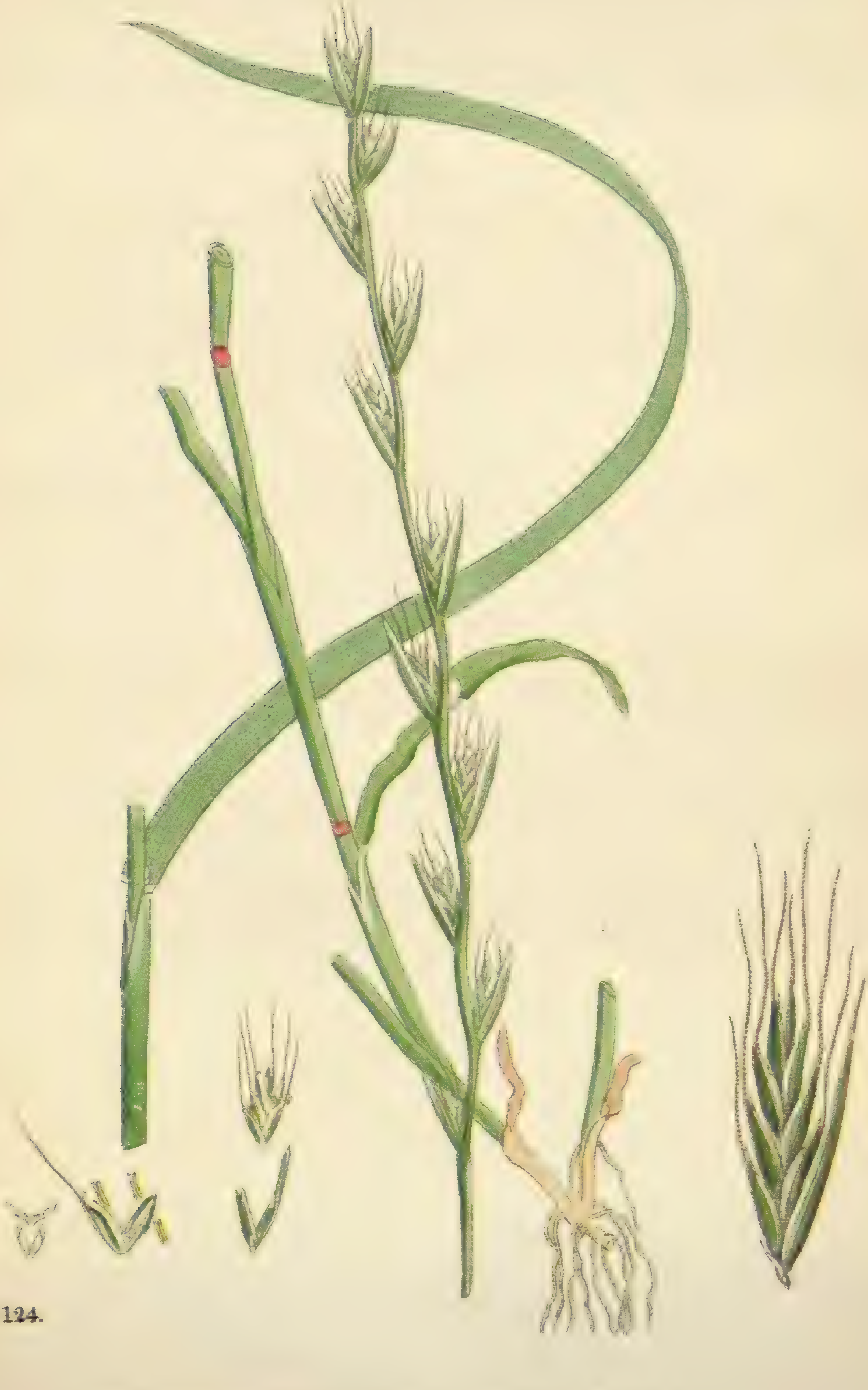


E. B. 315.

Lolium eu-perenne. Common Rye-grass.

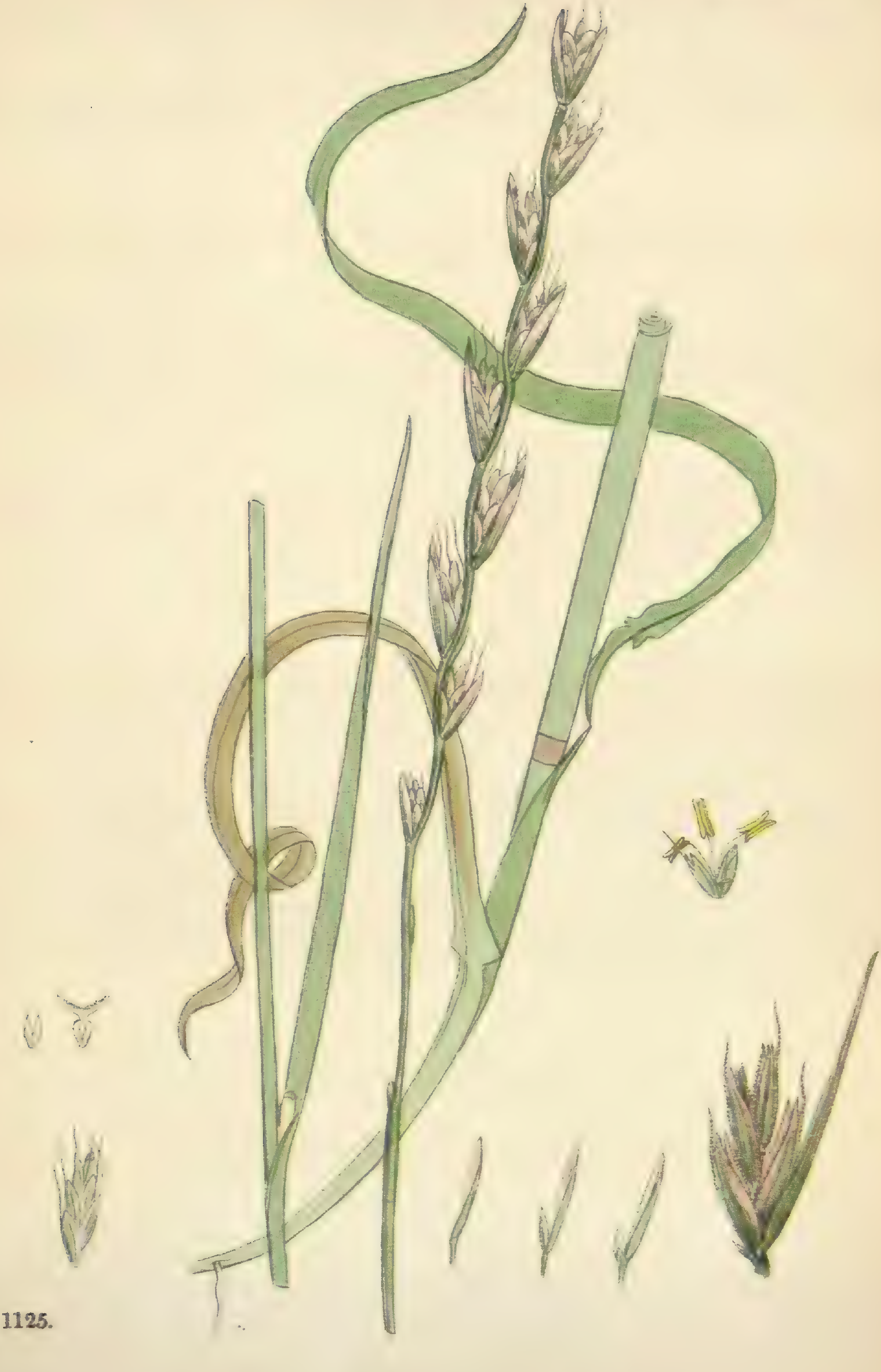


Lolium Italicum. Italian Rye-grass.



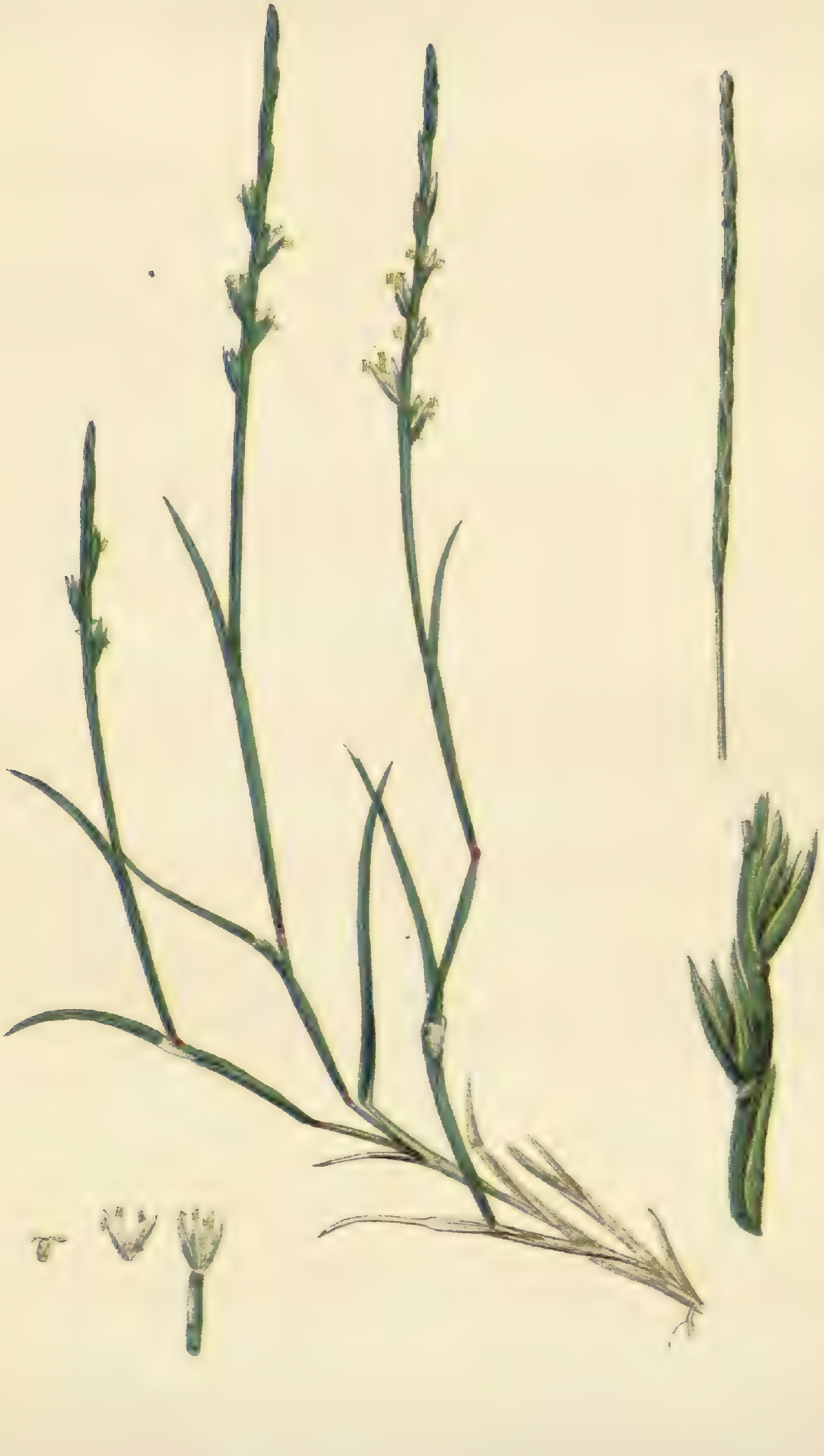
E. B. 1124.

Lolium temulentum, var. genuinum.   Common Darnel, var. *a*.



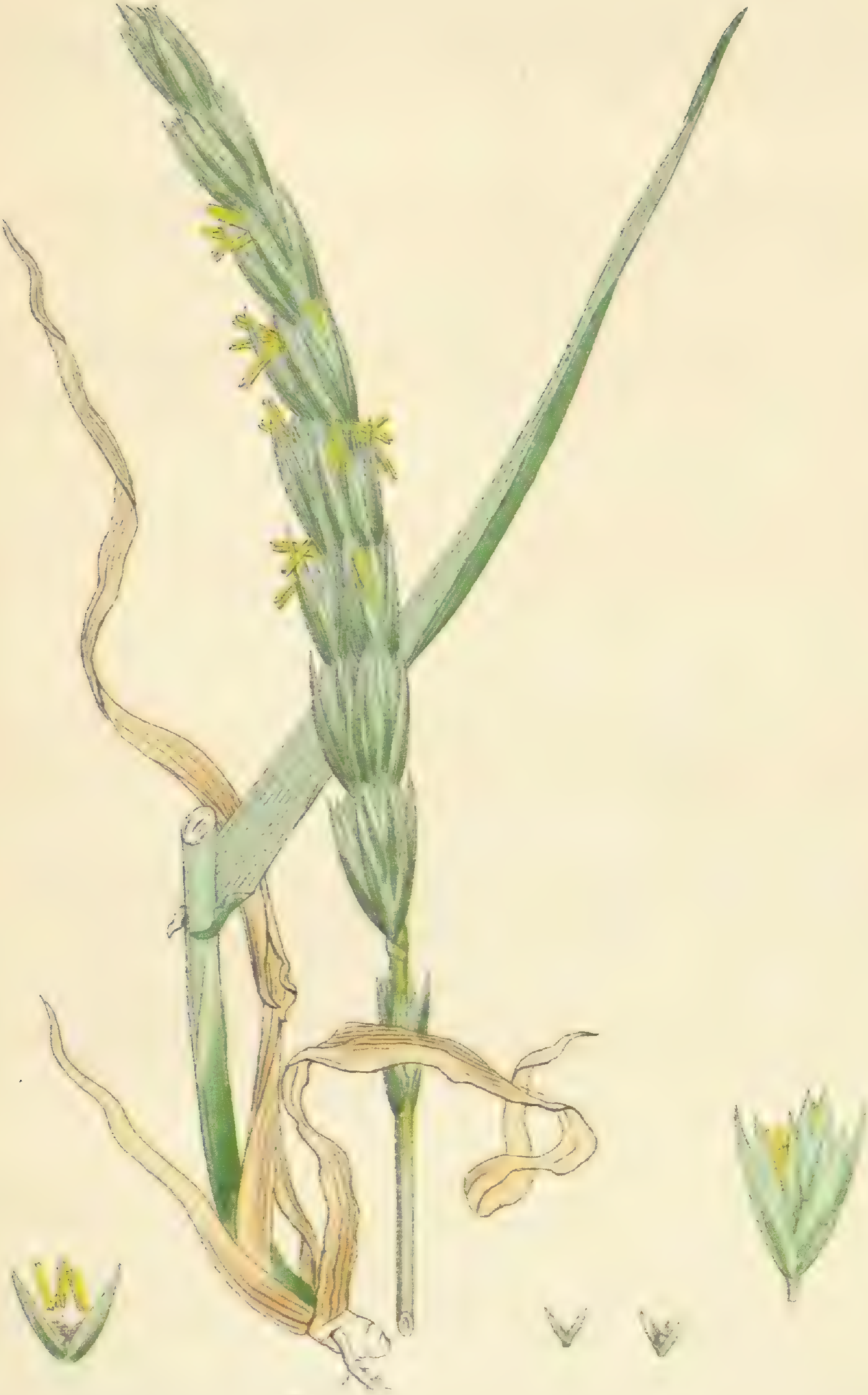
E. B. 1125.

Lolium temulentum, var. arvense. Common Darnel, var β.



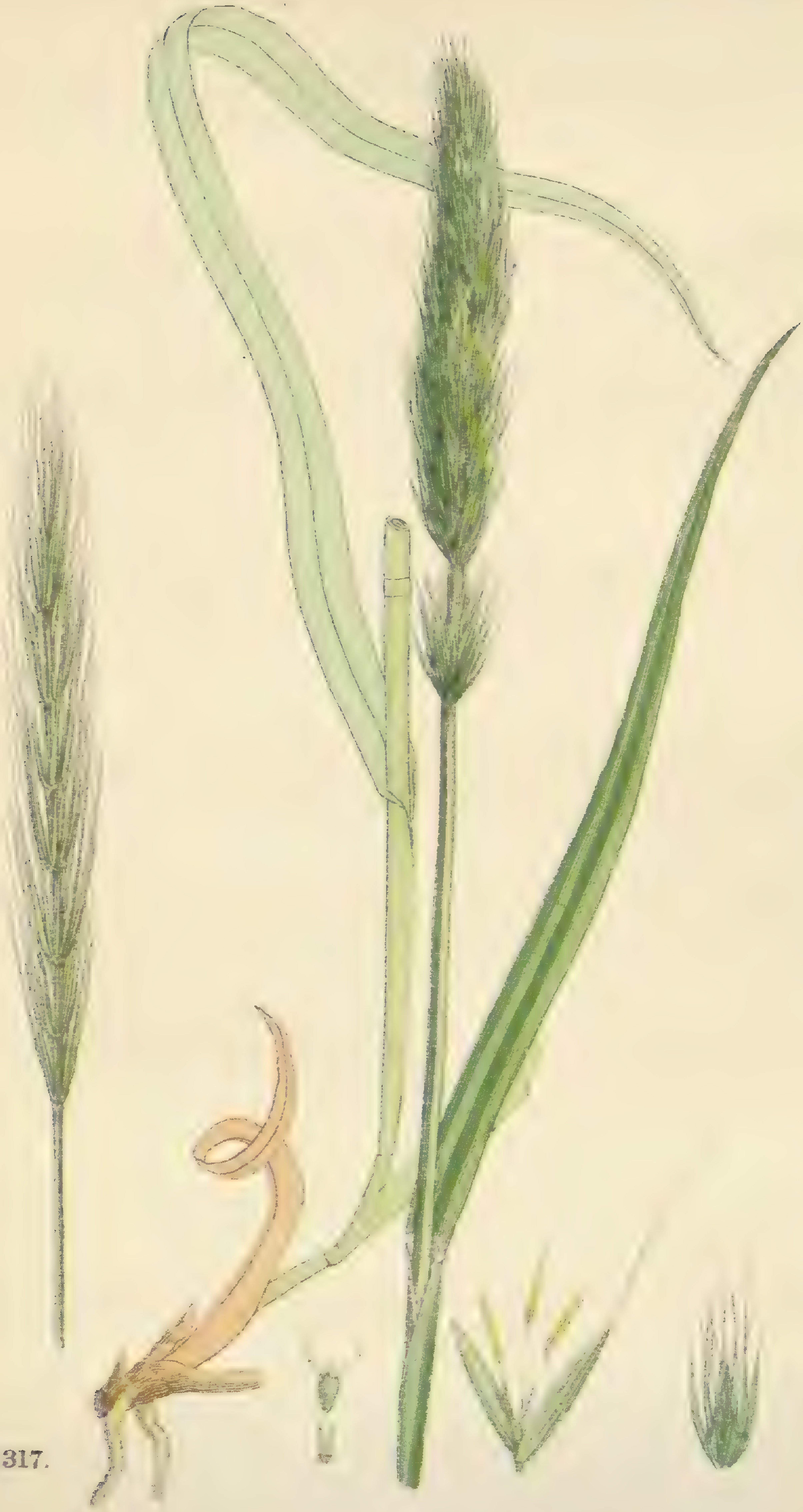
E. B. 760.

Lepturus filiformis. Sea Hard-grass.



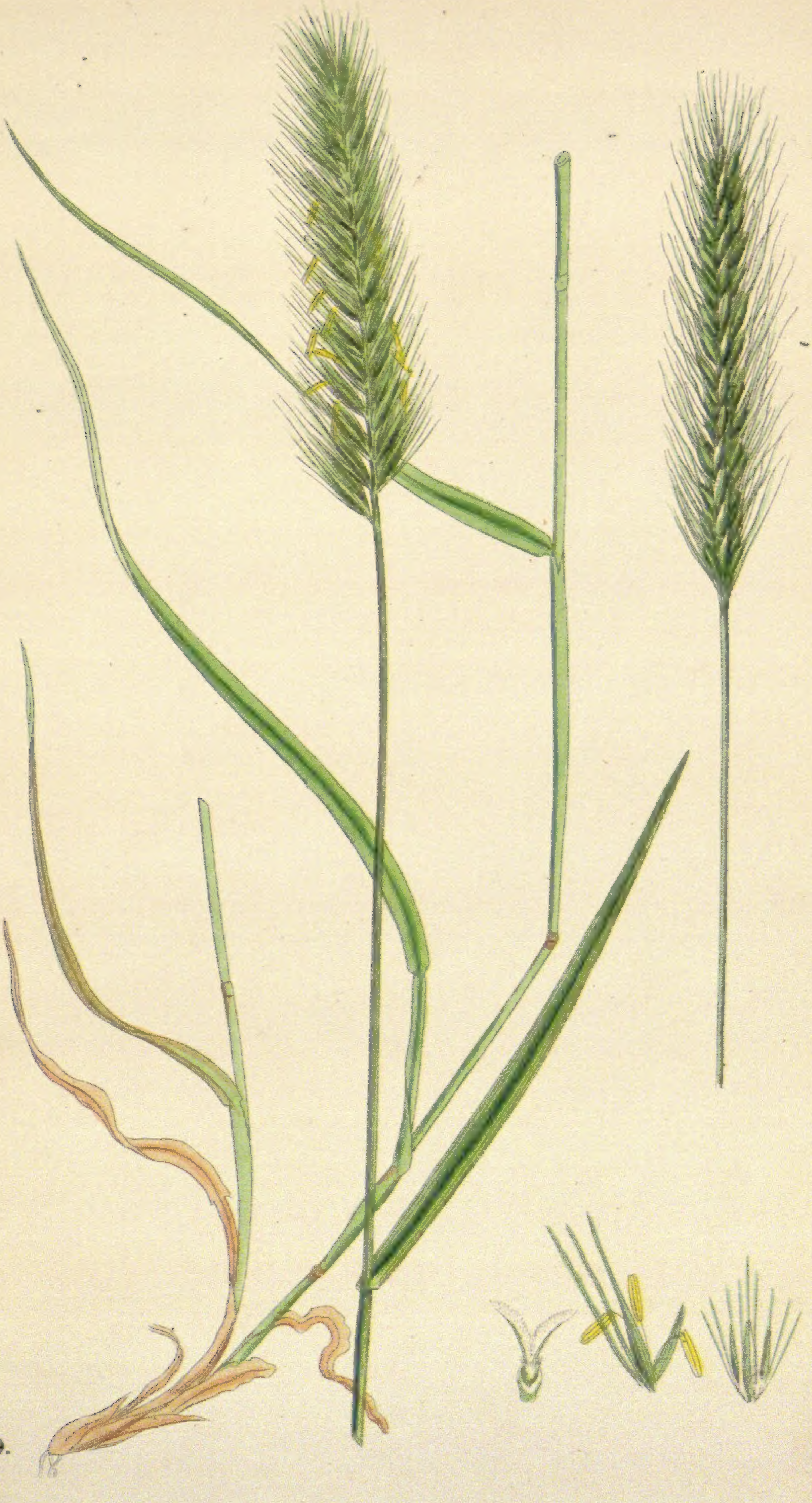
E. B. 1672.

Elymus arenarius. Sand Lyme-grass.



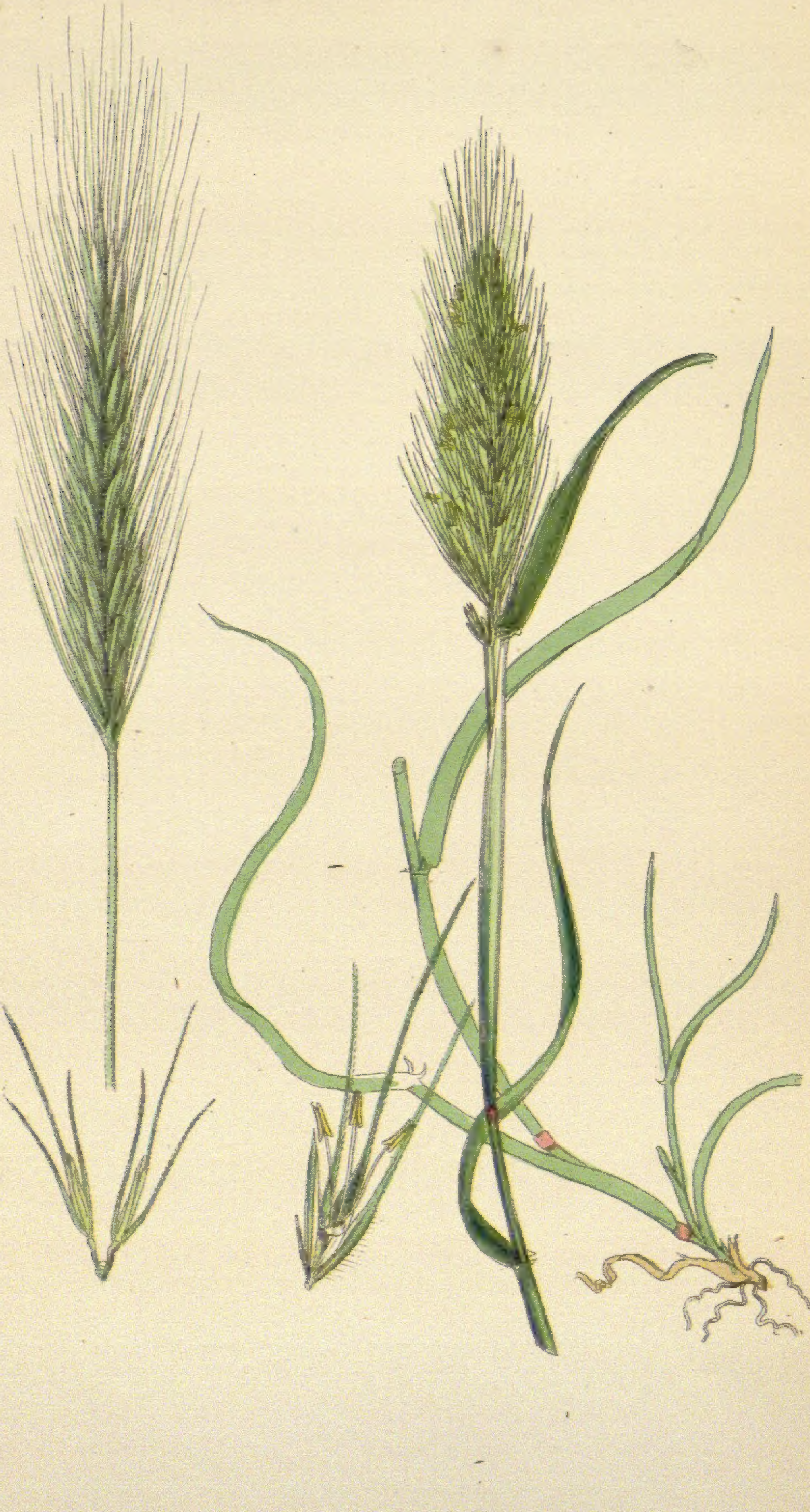
E. B. 1317.

Hordeum sylvaticum. **Wood Barley.**



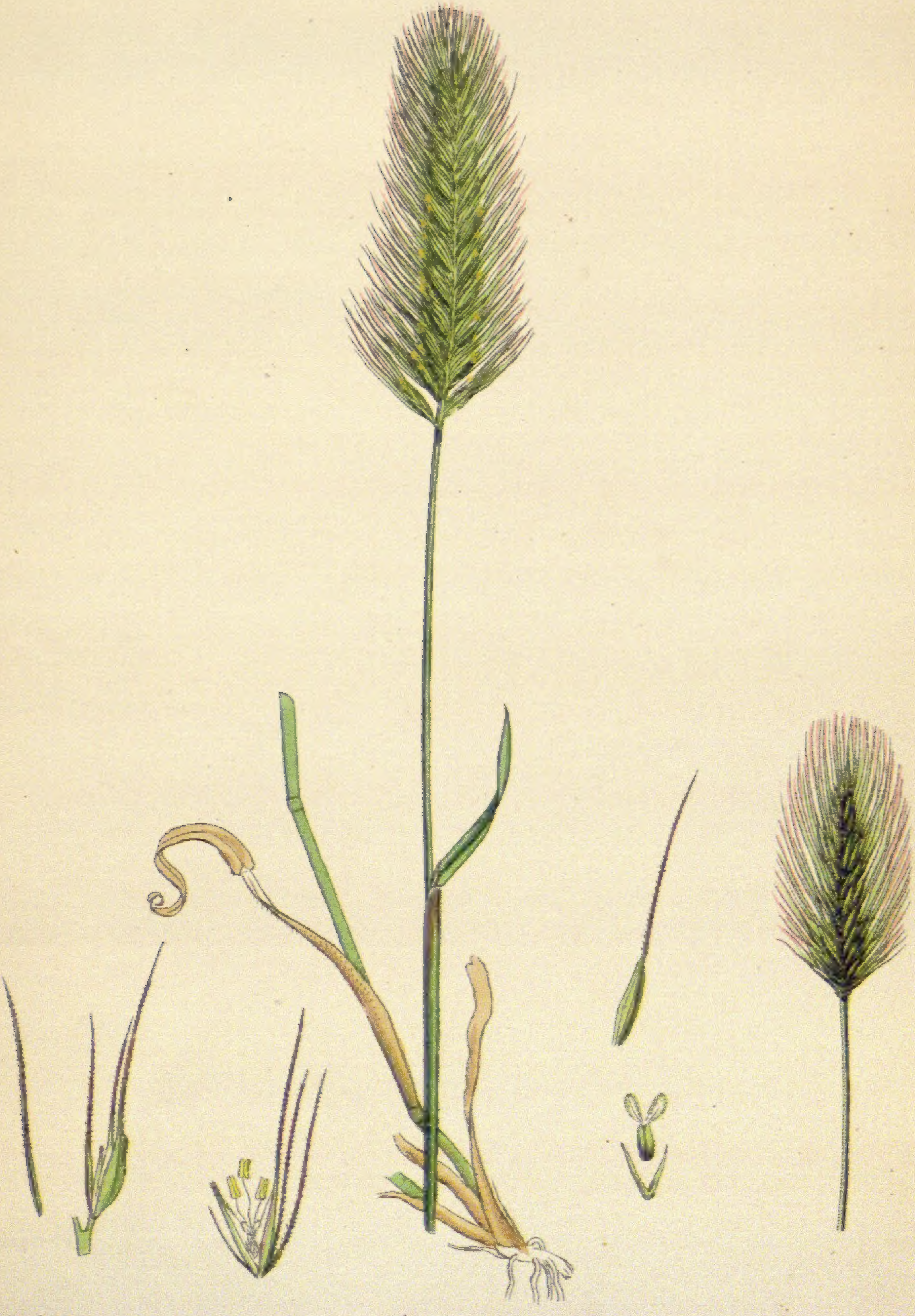
E. B. 409.

Hordeum pratense. Meadow Barley.



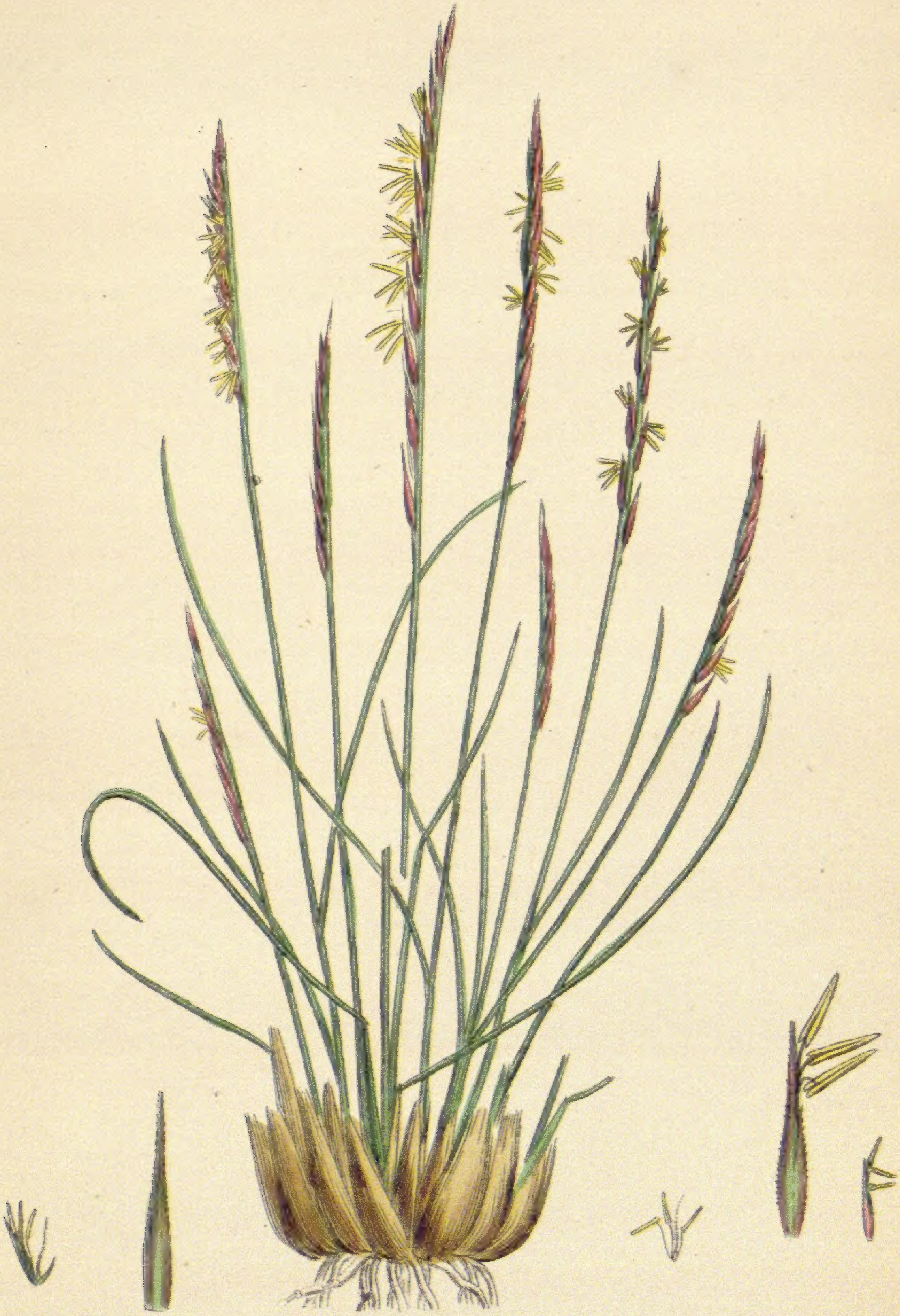
E. B. 1971.

Hordeum murinum. Wall Barley.



E. B. 1205.

Hordeum maritimum. Sea Barley.



E. B. 290.

Nardus stricta. Mat-grass.